

# SUPPLEMENT.

# The Mining Journal, RAILWAY AND COMMERCIAL GAZETTE:

FORMING A COMPLETE RECORD OF THE PROCEEDINGS OF ALL PUBLIC COMPANIES.

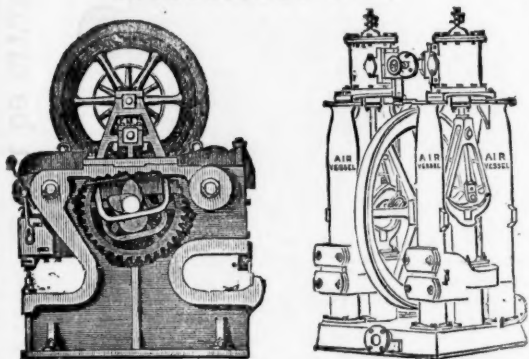
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LONDON SATURDAY, DECEMBER 14, 1878.

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FALMOUTH, 1867.  
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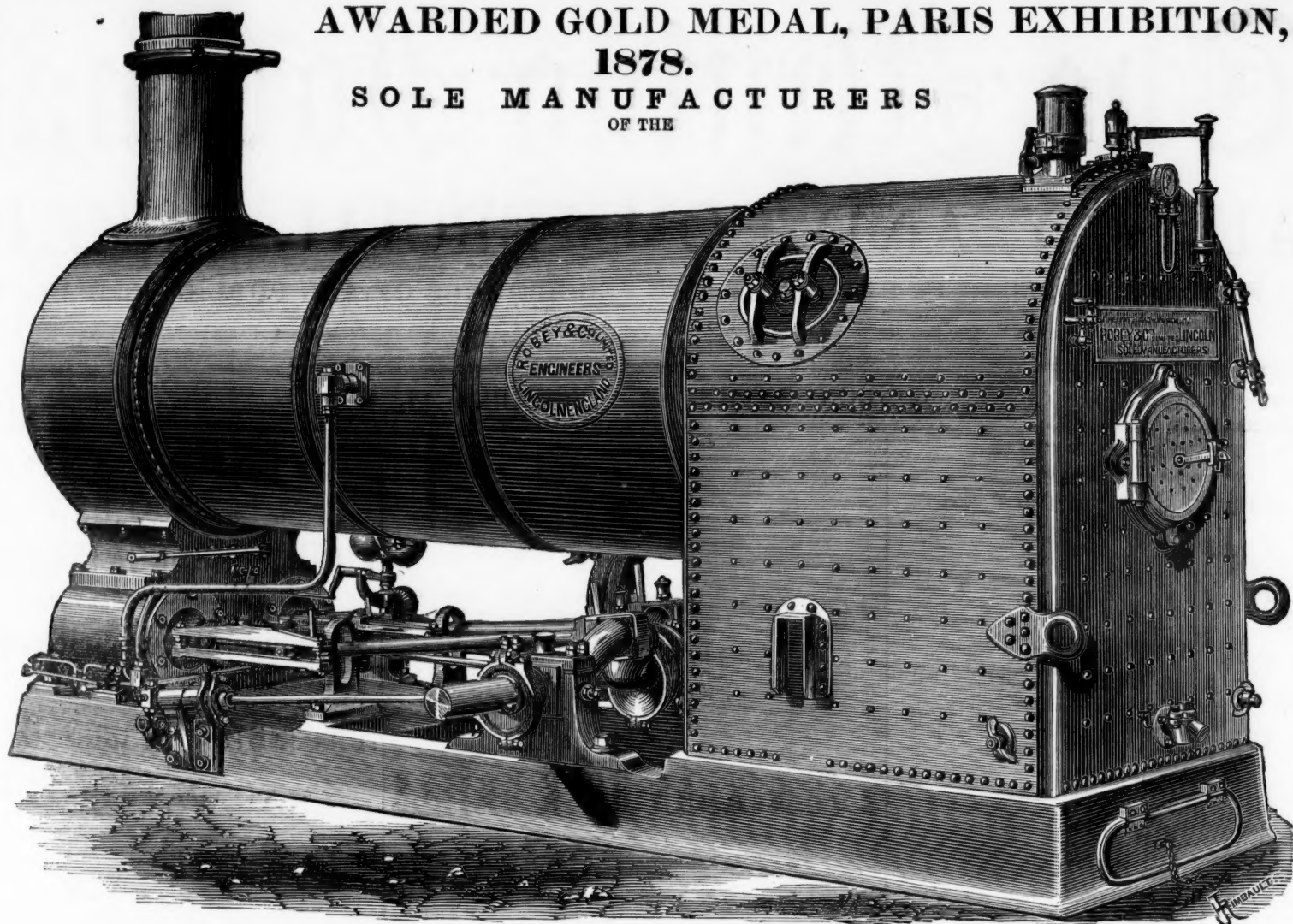
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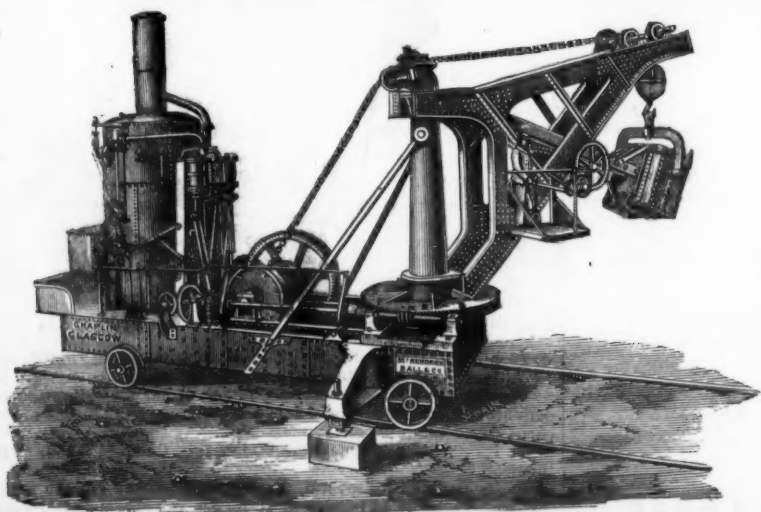
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## Original Correspondence.

## MINERS' NATIONAL RELIEF FUND.

SIR,—The editor of a newspaper—for many practical purposes—is as potent as a crowned head; and as you have written sarcastically about my letter on the above subject to Her Majesty, it may well be that you will consider I am taking an analogous liberty in addressing you, and thus trespassing—as you call it—upon the “courtesy” of the “Court.” We cannot all of us be as well up in the proprieties as the choicer spirits of mining literature; and I quite see that in the hot haste provoked by the fearful loss of life at Abercane, I made a mistake in the mode in which I approached Her Majesty; though the “courtesy” of the Queen’s late secretary did not evaporate—as you appear to suppose—in the one published reply, but has been continued in several subsequent communications by himself and his successor. Both these gentlemen have manifested a strange lack of that invidious estimate of my motives, which would appear, unfortunately, to have possessed you, as the recognised *arbitrator morrum* for people who subscribe for the relief of suffering.

So much in reply to the personal portion of an article of Nov. 30, which I only saw this morning. In regard to the general question of a central permanent relief fund, I must repudiate the statement that I have ever propounded any “scheme,” as you are pleased to term it. I certainly suggested a national fund, but in all that I have written upon the subject I have expressly guarded myself against laying down any exact or definite lines—believing that, if the idea were taken up at all, there would be valuable and experienced aid derivable from many persons far fitter than myself to elaborate the *modus operandi* in the future. You lay considerable stress upon the value of local societies; but of what avail were these when the late catastrophe occurred at Abercane? Of what use would they be if a similar blow-up happened somewhere else tomorrow? My contention is that the present dispensation of charity resultant upon great mischief of the sort is cumbrous, time-wasting, partial, and even unjust in its operations. The Mayor of Manchester recently said that public men occupying positions similar to his were very awkwardly placed *vis à vis* of these reiterated appeals to the public, and that his hands seemed always to be diving into other peoples’ pockets. His worship might have added that it was also rather awkward that himself and his brother chief magistrates in London and Liverpool were in the main the only officials appealed to—by far the majority of their worships throughout the country going scot free. Yet why Manchester and Liverpool should get up subscription lists whilst Bristol and Birmingham, Penzance, and Norwich do nothing of the sort, it is difficult to understand. No doubt you will be able to throw a competent light upon the subject.

I have been accused, in “a scheme” which I never propounded, of overlooking existing local organisations for relief, and therein to have done wrong to those important bodies. So far from having done this, I actually quoted in one of my letters the rate of relief afforded by the Durham societies; and in a previous letter I suggested that the Central Trust, which I hoped would ultimately be constituted, should distribute its grants when made through the relief society of the district. If you and I cannot agree about other things—which personally I regret—I think you will go with me in this statement at least—that it is in the last degree deplorable that persons who might desire, and who, doubtless, already have desired, to leave some money for the relief of the families of miners in their wills, are now unable to do so through the absolute lack of any constituted trust for the reception of these funds. Other branches of employment are safely provided for in this respect—the lifeboat fund, for instance, and others which might be mentioned. Why not the miners? Would it really militate seriously against an arrangement of the sort if all the bishops in England were to baptise it “Centralisation?”

I am afraid your Editorial judgment has been unduly warped by the speech of the Bishop of Manchester, or something else. How otherwise can one account for your change of tone on this question of centralisation and my championship (?) thereof between Oct. 19 and a subsequent issue. In the former notice you take credit for having advocated a “National Permanent Relief Fund” for 25 years! In the same article you do me the honour to say that I am so well known for my energy and perseverance that “there is now a reasonable prospect of the suggestion (the italics are mine) being carried to success.”

What have I done in the interval to offend your susceptibilities that I am all at once so undesirable a coadjutor in efforts to do good as your latest utterances herein would seem to suggest? Perhaps you will answer that second thoughts are always best; and, as you are the judge of those thoughts, I fear I can have no appeal. I am as unlucky, apparently, with judges of ability as with kings and potentates generally; and my excuse must be that if I have got hold of an inexpedient idea—ridiculous in itself, and withering to the common sense of bishops—I have only sinned recently, instead of “keeping at it” continuously for 25 years. ELLIS LEVER.

Manchester, Dec. 7.

[The regrettable discrepancy to which Mr. Lever refers arose from prominence having been given to the views of a correspondent without an accompanying statement that his opinions were not in any respect endorsed by the Editor. Of the desirability of a Miners’ Permanent National Relief Fund the Editor has never entertained the slightest doubt, and that with the assistance of Mr. Ellis Lever, whose energy and perseverance was correctly noticed in our article of Oct. 19, the prospect of the Fund being incorporated is better than at any previous time is equally beyond question. So far from our judgment having been warped adversely to the Fund by the Bishop of Manchester’s speech, we are convinced that not only will Dr. Fraser throw no obstacles in the way, but that his caution will be positively advantageous to the project. He is the most popular and practical bishop on the Bench, and is, therefore, able to point out better than many others defects which would lead to failure, but as soon as a really workable plan—which can only be hoped for by criticism and amendment—is secured, the Bishop of Manchester will be found amongst the last to shirk the necessary hard work to make it a success. We are glad to learn that the establishment of the Fund is progressing satisfactorily, and that Mrs. Lever has received a letter from Windsor Castle authorising the announcement of a subscription of “one hundred guineas in memory of Sir Thomas Biddulph in aid of the Miners’ National Relief Fund,” although the donor (a lady) does not permit her name to transpire.]

## BOILER EXPLOSIONS.

SIR,—The Manchester papers of Tuesday last contain an account of an explosion at a colliery of a steam-boiler consequent on its being overheated through deficiency of water, the latter arising from the packing being forced out of a manhole or mudhole joint at the lower part of the boiler; and I much regret to note that the accident has been accompanied by very serious injury to a number of men.

As cases of deficiency in water in steam-boilers, arising from various causes, are numerous I think that the following remarks will not only be interesting but probably instructive to many steam users and boiler attendants. I have long been convinced that if a boiler has become short of water and the plates are already bared attempting to draw the fire is generally most dangerous, as the operation will usually much increase the heat of the furnace or furnaces. In many such instances rupture of the plate has occurred, accompanied with scalding and fatal results to those engaged. I subjoin extract from our printed “Instructions to Firemen” on this point:—“Should the water fall below the proper level draw the fire at once; but if the furnace plates are already bared of water when deficiency is discovered, it will be preferable to damp the fire, by immediately throwing on ashes or other non-combustible matter, as the act of drawing them might cause serious increase of heat.” Should sufficient ashes or other suitable material not be immediately available for the purpose the fire may be considerably checked by immediately closing the damper, and by throwing on as rapidly as possible a large quantity of the smallest coal. The connection with the damper should always be readily accessible in the firing place, and not necessitate climbing on the top of the boiler to reach

it. Many owners object to applying safeguards against deficiency of water to their boilers, alleging that such apparatus renders the men more careless. From my investigation of some hundreds of explosions, and the inspection of many thousands of boilers, I am convinced that, in the main, this idea is quite erroneous. Deficiency of water may arise from many accidental causes, for which the attendant is not actually responsible, and even the best men are liable to mistake; whilst steam-boilers are not always constantly attended by the same man, but are occasionally in the charge of watchmen and others during the night or at other times. Our company is so impressed with the importance of the attachment of the low-water apparatus that we now allow a discount from our insurance premiums for all those I consider of an efficient character, although we give an especial preference to the “double cone” fusible plug.

As a contrast to the above case, I may mention that some years ago a Cornish boiler situated, like the exploded one, at a colliery and down the pit became short of water whilst in full operation, owing to the fracture of the blow-out pipe. The rush of water, &c., from this pipe was so great that the fireman could not get near to draw the fire, but was obliged to withdraw to a safe distance. Fortunately the boiler was fitted with a double cone plug, which promptly acted, and prevented any damage whatever. The low-water safety-valves frequently applied are a valuable fitting, as they are likely to direct the attention of attendants to any deficiency which may arise; but I advise in addition a good fusible plug to each furnace or *flue*, as no valve, however powerful, can in some cases discharge the steam with sufficient rapidity to prevent damage.

A case occurred a few weeks ago where after the cleaning of a boiler the blow-out tap was inadvertently left open, but the orifice was closed with muddy deposit swept from the boiler, which retained the water when it was filled up, and led the attendant to believe the tap was closed. Steam was got up, but when it reached about 20 lbs. per square inch the mud was forced away, and the water rapidly escaped. The attendant noted this, and commenced immediately to draw the fire, but before he could complete one furnace the water had fallen so low that the crown of the second furnace had become red hot, and was bulged down almost to the fire-bars, fortunately without rupture. The boiler was provided with a low-water safety-valve, but such apparatus could not possibly prevent damage in such a case. Had there been reliable fusible plugs in addition these would have acted, and have averted the great risk of explosion which was incurred.

I may add, in conclusion, that it is useless to apply any fitting or preventive apparatus unless these have that regular and careful attention requisite to retain them in reliable condition, and which is indispensable to every detail in connection with steam-boilers.

HENRY HELLER, Chief Engineer.

The National Boiler Insurance Company, Manchester.

## ON CONSUMPTION OF FUEL IN MINING ENGINES.

SIR,—Having already in former papers given the result of experiments with Lancashire and common cylindrical boilers as to evaporative power in pounds of water per pound of coal consumed; and with the cylindrical boilers experiments as to the comparative economy of hand firing and mechanical stoking have been noticed. It has been shown that with powdered coal and the proper quantity of air blown into the fire-box to ensure complete combustion, much better results have been obtained than with the largest steam coal and firing in the ordinary way. There is room for effecting greater economy in firing boilers by mechanical means; as yet Jucke’s fire-grate is the only apparatus that is much adopted. It is certainly a perfect consumer of smoke, but a more perfect apparatus is required to supply small coal and air simultaneously and in proper proportions to afford complete combustion.

Boilers of the locomotive type are now much used, both for mining and agricultural engines; indeed, it is the agricultural engine, with various modifications, that has been applied in mining for winding and hauling coal, and for pumping water. Very good evaporative results have been obtained with this form of boiler, though the ratio of fire-grate and area of heating surface vary considerably. The area of fire-grate being given, the consumption of fuel would be influenced by the draught of the chimney, or the blast-pipe, as the case may be, and the quality of the fuel. The proportion of heating surface in locomotives varies from 50 or 90 square feet to 1 square foot of fire-grate. The combustion of fuel varies from 50 to 80 lbs. per hour per square foot of grate. The relative value of fire-box and tube surface is not considered of much importance so long as the heat given out by the fuel is absorbed by the water to the fullest extent. In some cases the effect of the fire-box is found to be much greater than that of the tubes—that is, when the duty of the boiler is little, but when the duty is increased the tubes take their part of the duty, and the ratio of greatest effect is on the part of the tubes. The ratio of surface of tubes to that of the fire-box in locomotive engines varies from 8 or 15 to 1.

Fuel may be used in a gaseous as well as in a solid form; the gas produced in blast-furnaces is now utilised in heating and producing steam in the boilers at many ironworks; and in the solid state it may be used in various forms, as large and small coal, the latter giving more heating effect provided there is proper access for the air to act on the particles. As an example of the evaporative power of locomotive boilers, the following is the result of a trial of one of the best agricultural engines at Cardiff in 1872. The engine was of 8-horse power nominal. Steam was used of 80 lbs. pressure per square inch; the horse-power developed by the engine was 14. Area of fire-grate as used was 3.2 square feet, but the full size of grate was 5.3 square feet. The total heating surface was 220 square feet; of this 25.4 was in the fire-box, and 194.6 in the tubes, in the ratio of 1 to 7.6; the heating surface relatively to fire-grate used was thus 69 to 1. The fuel used was Llangennech steam coal, its theoretical effect in producing steam from water at 60° was found by analyses to be 13.2 lbs. of water evaporated by 1 lb. of coal. The evaporative duty of the engine experimented on per hour using this fuel was 419 lbs. water, or 6.7 cubic feet. The duty was equal to 1.9 lbs. of water per square foot of heating surface: 40.9 lbs. of coal were used per hour, giving 10.24 lbs. of water evaporated per pound of fuel, and 12.8 lbs. of coal consumed per hour per square foot of grate. To obtain this result the coal was added 30 times in an hour, and no more air was allowed to enter than was requisite for complete combustion. This frequent application of the fuel is more like mechanical firing, which could not be carried out in practice. The evaporative duty per hour per foot of fire-grate used is — = 131 lbs.

3.2

The ratio of evaporative duty given out by the fuel to the theoretical duty is 13.2: 10.24:: 100 = 77 per cent. The temperature of the heated air escaping at the smoke-box into the chimney varied from 360° to 418°; this is, perhaps, as low a temperature as can in practice be obtained at the bottom of the chimney. The heated gases escape at that end of the tubes at a great velocity, not affording sufficient time for a further absorption of heat. The lengthening of the tubes has not been found of any service. The gradual expansion of the tubes towards the smoke-box might produce a lower temperature of the escaping gases. The temperature of the atmosphere was 60°; this from 360°, gives 300° of heated air lost in the boiler.

From this experiment we see the great utility of careful firing, and what might probably be achieved by a mechanical method of firing, admitting only as much air as is required for perfect combustion. The heating surface was 70 times greater than the area of grate utilised, the waste gases escaping at a temperature of 418°, and as low as 360° at the funnel.

The following gives the result of similar trials on an engine running on the Midland Railway. The fuel used was coke, and the temperature of the feed water 60°. The ratio of tube to fire-box surface was 10.3 to 1. Ratio of total heating surface to fire-grate area, 74.3 to 1. Area of fire-grate, 9.4 square feet. Coke = 132 lbs. consumed per hour per square foot of grate. The water evaporated per hour was 162 cubic feet = 10,125 lbs. Consumption of coke, 1267 lbs. per hour, equal to 7.98 lbs. of water evaporated per pound of coke burnt. Temperatures as taken by pyrometer in the fire-box, 2747°, and in the smoke-box 937°, showing a difference of 1810°

absorbed in heating the water from fire-box and tubes. On the rate of the transmission of this difference of heat to the water a great deal depends. The observed temperatures on an engine on the Caledonian Railway were—in the fire-box 2420°, in the smoke-box 363°, and the evaporative duty of this boiler was 10 lbs. of water heated from 60° by 1 lb. of coke. This alone shows the importance of the absorption of heat in the boiler as far as possible in the high duty of the latter experiment.

It has before been explained that economy of fuel is not in accordance with hard firing. In locomotive boilers from 50 to 60 lbs. of fuel per hour per square foot of grate is the rate giving most perfect combustion. With hard firing the loss arises from carbonic oxide passing away unconsumed.

It should be observed that the value of these experiments depends much on the quality of coke used. An allowance of 8 per cent. for ash and water combined with it must be made, and more than this in some instances. It is not known whether the coke was of the same quality in the two locomotives experimented on. It is presumed the same coke was used, and the difference in evaporative duty is accounted for in the temperature of the gases in the smoke-box. To treat the fuel so as to give a proper admixture of air by mechanical means would certainly be very desirable to ensure perfect combustion, and the absorption of heat by the water should be as complete as possible to give economy in consumption of fuel. M. E.

## CHONTALES MINING COMPANY.

SIR,—At a meeting held on Nov. 28 the attendance of the shareholders was few in number; in the concise report of the meeting in your valuable Journal there is the absence of information on points in detail. It would appear that the directors gave an order to Messrs. Harvey, of Hayle, for 36 stamps to be put in hand, that order was given Aug. 9, 1877; 24 were executed in October, the remaining 12 in November. I went to the meeting gratified with the opinion of a mining engineer who has distinguished himself in Spain, and was accompanied there by one of the original shareholders of the Chontales Company (and by a system introduced by him in working a mine effected a saving of 50 per cent.), also by a gentleman who has returned from Australia, a manager of gold mines, introduced to me by the Principal of the Mining School for Bristol. They informed me that 36 stamp-heads, 36 shoes of prepared steel, 36 tappets, steam band to drive pneumatic stamps, and mercury, might and ought to be executed and delivered within one month of the order being given. I handed in a letter I received from the Tuckingmill Foundry Company, Camborne, Cornwall, in which they stated they would undertake to deliver in fourteen days after the order was given 36 stamp-heads. The noble Chairman made the statement that they were satisfied with Messrs. Harvey, that they had always taken care to complete their orders with satisfaction to the board, and referred to a wheel on one occasion, that rather than send out one imperfect they had cast three. As a shareholder that spur wheel I shall not easily forget; it was my first introduction to the bar at Greytown. The wheel completed, when forwarded the bar prevented its delivery; the delay occasioned when landed its being carried to its destination in consequence of the San Juan river. I ask the question, if those who have to supply us with machinery ought not to be under contract to deliver in a given time, or take upon themselves the responsibility that arises from the delay? If one company would not another may. Time with us is the essence of the contract, whilst I admit that it is essential that machinery forwarded to so great a distance should be executed in the best manner. I would further remark, in reference to the observation I made as to the time machinery could be executed, that Mr. Truran prompted the noble Chairman that Mr. Bell had tried stamps by other makers, and that he knew the firm I alluded to. No doubt the Tuckingmill Company can give first-class references as to the machinery they supply. Mr. T.’s opinions seemed to have a crushing influence upon any remarks that I had advanced as to economy of time in supplying machinery.

It next becomes a question as to the transit of machinery. We have at our command a line of steamers of which it may be said they are second to none. Before going to the meeting I called at the office of the company, in Moorgate-street, and endeavoured to obtain information why machinery, stores, &c., sent out by them in October, 1877, were not delivered until March, 1878. They could not give me any satisfactory information, and I found at Gresham House the fog equally as great. The only information I have been able to obtain is that on arrival at Greytown on the first occasion the bar prevented, and that upon another occasion the mailboat was too much laden to take our machinery, stores, &c. On the arrival at Greytown the mailboat remains four days, and if heavy machinery cannot be delivered why not portions of lesser weight? Bar or no bar the mails are delivered. It seemed a question with the Chairman as to liability, and if liable a difficulty as to damages.

If you refer to the report of the half-yearly meeting—June, 1877—the agents make a statement that the machinery had been delivered; they contradict that statement, and up to the present time no information has been received from them to account for the delay. In consequence of the time that has been lost in the arrival of machinery, &c., we crushed only 250 tons during the month of April this year. If we take Mr. White’s report, and the opinion he expresses, that on his arrival no one could tell him where he was to get an ounce of gold, and that the mines were all run together and had to be re-timbered; if you trace results from August to January, 1878, you will find continuous profits, although those profits were reduced (as the machinery became impaired); whilst we find the losses commenced increased, until he was supplied with and erected new machinery; after that the profits have increased from in July 1711. August 2861, and September to 6721. 2s. Our report gives for six months ending June 3602 tons of ore crushed, for the three following months 5030 tons, and were it not for the unprecedented dry weather he has a capability of crushing 2500 tons a month. The cost that was 11. 2s. 5d. per ton is reduced (less the office expenses) to 13s. 3d. a ton.

The next question is that of calling up debentures. Mr. White in his letter says: “I would advise that the returns should not again be interfered with, and that no new outlay should be made for the present, as this season, with the last, seems to be something unusual, and next year we may again get rain, as in former times, and if so very little steam power will be required at San Domingo. Not only so, but by that time I hope to see the company in a good position, when I shall be able to decide with greater courage and better judgment for the future permanent working of the mine.” As regards the steam-engine, what is it to cost? 1000l. For what purpose? To drive pneumatic stamps, which can be driven independent of steam. After the years we have had them what number of tons have they crushed? 528. What is the number of Cornish stamps they are equal to? Five. When would it arrive, especially ordered at this time of year? A query the shareholders are asked to go into debt, and pay 10 per cent. for so doing.

There was another question I brought before the board. When at the West India Mail Company’s office I made enquiries as to the route to San Juan del Sur via Panama. I found that the boat left Panama for San Juan del Sur on the 15th of the month; the mail leaves Southampton on the 18th, arriving on the 8th of the following month. As regards freight, it is nearly double. By that route the bar at Greytown and the San Juan difficulties are overcome. I referred to the Wheeler pans having gone that route from San Francisco, and that the directors were aware of any difficulties that presented themselves. Mr. Truran prompted the Chairman that the difficulties were equally as great by way of San Juan del Sur as via Greytown. I am getting posted up on that point by a gentleman going to Central America.

I am informed by a reliable authority that we can do without steam power, that by means of a 3-in. diameter pipe 5000 tons of quartz could easily be crushed per month throughout the year; that the cost of the arrangement would not be expensive. It would consist of an arrangement of piping which would be of some length, and of a system of piping to work with a high pressure turbine. As regards our manager, Mr. White, we are fortunate as a company in having secured his services, and if he has the co-operation of those we have to look to at home we have nothing to fear.

I will conclude with an extract from a letter of mine that ap-



appeared in the Journal of Dec. 22, 1877:—"The mine stands before us faultless; has advantages few mines possess; quantity of auriferous ore unlimited; can be worked independent of sinking shafts and machinery to haul to surface, there being a rise of 500 ft. in two miles of the company's property, and we are well through one mile of the property; in every 50 yards there is a vein of gold, which if found at surface descends to a great depth. We are in the hands of the directors, and if men are sent out who understand the duties they undertake to perform, are sober and honest, the requirements of the mine duly ordered and executed without delay, we have nothing to fear, but reasonable expectations of realising good dividends. Without good management, however good the mine may be, the best concerted schemes prove vain and never succeed."

All Saints-lane Exchange, Bristol, Dec. 5.

#### AMERICAN IRON (Fe) ORE.

SIR,—In the Journal of Nov. 30 I observe a letter by one of your correspondents on the Iron Question of America. The place to which your correspondent refers is one well known to myself, and I can fully corroborate his statements relative to the famous iron region of Ishpeming. I have spent some eight months in the iron mines of Michigan, during which time I observed closely the geology of that country. All my observations convince me fully that Marquette County is destined to greatness. The iron has been traced for some 25 miles in an irregular course. The outcroppings at certain points show indications of stupendous deposits, and Ishpeming I believe from general observations will, comparatively speaking, be the inexhaustible discovery. Ishpeming a few years ago was a very disagreeable swamp through which it was very difficult to pass, but those having all confidence in the country hauled sufficient poor dirt to fill up the swamps, and made it sufficiently solid on which to build the city of Ishpeming, which has at present, I judge, from 6000 to 8000 inhabitants. The bluffs are linked around the city, on the surface of which the Fe outcroppings are plainly seen. Judging from the general pitch, and other characteristics, I conclude that immediately under Ishpeming there is one vast basin of iron ore. Ishpeming produces the soft ore (hematite) which yields about 60 per cent., and the hard ore (magnetic) yielding 85-715 per cent. This marvellous iron region is reached by the Chicago, North-Western, and the Michigan Central Railroads, the latter having a branch running to Marquette city from the junction at Vegganue. Vegganue is near the commencement of this iron region, and is a beautiful city, supported, of course, by the iron trade. Jackson's Main (Hematite, Fe) has been working over twenty years, and is to-day one of their best hematite mines. Ishpeming is situated but a very few miles from Vegganue. Eight miles from Ishpeming and Sagana is reached another, or the third, discovery of the hard ore. This discovery was made by an Englishman, Mr. John Mitchell, and was sold shortly after for \$300,000. Washington and Humboldt Mines are but a few miles further, neither of them being very extensive at present. Twelve miles further and the Republic Iron Mines are reached. These mines a few years ago could produce as much iron as all the other mines, the mineral being mined so easily. The lode here is about 60 ft. wide, and has very little impurities, indeed, the ore is very sensitive to pulverisation. The ore produced here is very rich. Another four miles and Keystone and Champion Iron Mines are reached. The latter of these places is a very extensive mine, the lode varying in width from 6 to 60 ft., some of it being worked on the open-cut principle, clearing the surface, and then underhand stope. Just across the Michigan Lake, a distance of a few miles, we have another large Fe mine.

There is yet plenty of room for capital, and I think they are just as sure of success as twice 2 are 4. I would say that after leaving the iron region I went to the silver region of Colorado. I have seen many mining camps through the United States, many of them needing capital, and promise good returns to capitalists; but unhesitatingly would speak of the Rocky Mountains as being unparalleled in their advantages to prospectors, though I would scarcely call it prospecting, as they are so sure of success. It is my firm conviction that there are greater fortunes hidden in the Rocky Mountains than have yet been discovered. The silver of the Colorado is immensely rich, and a very small streak of course would pay, it being properly worked. I have known fortunes to be made in the discovery of Ag deposits in a few weeks. Why, confidence in the success of properly worked silver mines of Colorado cannot be moved. It may be difficult to influence our capitalists to speculate in the silver region of Colorado, but I believe the time is coming when they will, and as sure as they commence so sure are they of great success.

If there are any parties desiring information on the mines of Pennsylvania, Michigan, or Colorado I shall be most pleased to give it as far as able either by letter or verbally. I have just returned from the Rocky Mountains of Colorado, and can give any information desired on the silver region of this sierra range. Parties desiring information will do well to avail themselves of this opportunity and address as below.—*Millom, Cumberland, Dec. 10.* A. B. C.

#### PROGRESS IN CANADA—THE NATIONAL POLICY.

SIR,—The event of this week is the arrival of H.R.H. the Princess Louise and His Excellency the Marquis of Lorne in Canada. All through Saturday, the 23rd, the city had been expecting news of the coming, but it was not till 6-40 P.M. that the Sarmatian entered the port of Halifax. Long before this reaches you your readers will be fully apprised of all the particulars, yet there are some thoughts that may be of interest.

Anthony's arrival in Egypt, the famous voyage of Cleopatra down the Nile to receive him. What a contrast between the effeminate luxury, the soft breezes, the quiet music of such a voyage, and that which mark the voyage of Princess Louise to Canada. In the former all the luxury and degeneracy of the last days of Egypt—in the latter all the manliness, courage, skill, and enterprise of the best days of England and the first days of Canada. In the former the sluggish Nile, with its banks bounded by papyrus reeds, the vessel a barge, propelled by oars; in the latter the broad Atlantic, terrible in its might, the good ship Sarmatian, propelled by the power of thousands of horses the voyage from the rock-bound coast of Ireland to the rock-bound coast of Nova Scotia. As the contrast is great in all these particulars so let it be greater in the results. The maiden Canada greets her mother England, and the whole people of Canada, from the Atlantic to the Pacific, greets the daughter of our Queen, and rejoice at the safe termination of an exceedingly stormy passage.

The victory over the storms of the Atlantic has been won, and the victory over the difficulties of Nature must be won. We must buckle on our armour, and make Canada what she is destined to become—one of the brightest jewels in the crown of England's Queen. Victor Hugo, in his "Toilers of the Sea," describes many thoughts which depict the fight which Canada has to wage. It is not against a foreign foe, it is not against a perfidious friend; but it is the bold free fight against Nature herself—to conquer Nature by the determined will and strong arms of a free, brave, upright people.

To wrest from Nature the undeveloped wealth which is fast bound in the rocky mountains—the gold and silver, the lead and copper, the zinc and apatite, and plumbago—these are some of the works yet to be done by the modern "Toilers of the Sea." And no time seems more auspicious than the present for the great undertaking. We have at the head of the Government a man like Sir John A. McDonald, a captain who has had 25 years of experience, and we have under him a crew composed of the ablest men now in Canada, we have a new Governor, the people have declared for a new policy—the National Policy. All the old grit government and dynasty have passed away—the Hon. Geo. Brown, the quasi-dictator of Canada, has lost his power, and no one believes any more in his government, or will answer again to the sound of his trumpet, the Globe. Perhaps no fall from power has ever been greater than that experienced by the Grits. They did not know that the people were aware what manner of men they were till Sept. 17 came, and they were found out. Five years have been lost in the progress of Canada—from 1873 to 1878 the country has not made

rapid strides. Let us see what will be done in the next five years let us see what the next five years will produce. I venture to predict that in that time Canada will make more rapid strides in material development than any nation in the world. There is no reason why the Pacific Railway should not be finished to the Rocky Mountains—there is no reason why the coal and ironstone in the O'Connell valley should not be utilised, and steel rails made in Canada out of our own iron, instead of importing them. Would it not be more sensible to import the workmen and machinery, and use our own material? Nature has placed the coal and iron together about half-way between Winnipeg and the Rocky Mountains. Why should not we start a "Palmyra in the desert?"

Toronto, Nov. 25.

BOURNONITE.

#### INVESTMENTS IN FOREIGN MINING.

SIR,—In the Journal of Nov. 2 I see an article on Canadian Mining, in which it says the cause of failure is frequently the want of capital to enable them to sink deep shafts; but this is not the real cause. The true cause is that the English capitalists have too often entrusted their money to unprincipled men, who have squandered and spent the greater part in enjoying themselves without attending to the interests of the company; and, of course, when the Canadians see how English money is thrown away broadcast they will not venture any of their own. For instance, an unprincipled man agrees for the purchase of a mining property in Canada or elsewhere at a low price, never examining carefully the title to the property (of which there are a great many faulty titles); he comes to England with a plausible tale and reports from professors and mining captains upon the property; forms a private company to purchase and work the property; and he himself is appointed managing director to go out and superintend operations; but, in fact, to live a life of idleness, for he may have no knowledge of mining. This managing director often appoints his mining captain, and a superintendent of the pitwork, also a friend of his own, as pursuer or paymaster; all these have high salaries, whilst one man ought to do the work of the three; he overlooks all the reports, only sending home such as he knows will please the directors; horses are kept at the mine professedly to do the mine work, but are used by these four men to drive about the country on various pretences; a shaft is partly sunk, but in a wrong place; machinery is erected at a great expense, but inferior quality, as is seen by its continually breaking down; an American Diamond drill is employed, which proves unsuitable for the work, as the A.D.D. Company find out, so they throw the contract up in disgust. Then this managing director erects smelting works, but finds he has little or no ore to smelt; and as the capital borrowed is about expended he returns to England for a further loan, making great promises and excuses for not getting ore, that it is not policy to bring up the ore until the levels are made and the mine more developed; and to endorse and confirm these promises he brings home the captain, who has been for a long time laid up with the gout (or rheumatism as he calls it), brought on by some cause or other. Well may the local people smile, and say how easily the English are gulled out of their money, and what a confiding people they are.

To encourage manufacturers and open up the rich resources of Canada, the Government have been in the habit of granting bonuses and giving remission of taxation for a number of years to new works, but being so often cheated they are chary of doing so now, for many works have been commenced in Canada just for the sake of getting the Government bonus, and when that money has been received the works have shut down. Railways have been built by the Government bonuses, and afterwards they have been asked for another bonus to keep them in repair. Now, this managing director will tell his company that by a further outlay he is sure to get a large bonus from the present Government, and an import duty imposed, so that he can compete with the United States manufacturers.

If mining is economically and judiciously carried on in Canada, where the indications for ore are true, there is sure to be a profit, and the Canadians will also invest capital, but where capital is entrusted to mere adventurers, who may look to their own interest and not the company's, no Canadians will invest, as they fear failure is certain; therefore, before investing in foreign enterprises let Englishmen investigate carefully the characters of the parties employed and the indications of the country, and not trust to a plausible and glib tongue.

VERITAS.

#### ORE-DRESSING MACHINERY.

##### A REVIEW OF WHAT HAS BEEN ACCOMPLISHED BY KROM'S AIR SYSTEM.

SIR,—Perhaps no one not concerned in the manufacture of ore-dressing machinery has done so much in a journalistic way as the writer in favour of the Krom system of air concentration with the view of showing it to be a successful rival of every device hitherto employed with water as the medium. Some 20 or more columns of the Engineering and Mining Journal of this city, and nearly half that number of the capacious columns of the London Mining Journal, place me upon the record as an earnest exponent of the Krom system. Prior to the publication of these articles and discussions, in the chief mining journals of the world, a pamphlet of nearly 40 pages octavo was published by me, almost exclusively made up of articles editorially written for the Colorado Herald, commending the Krom machine to the mining public. Since then, and up to a recent period, personal effort has been unsparingly devoted to the introduction of this machinery, and, doubtless, those who have invested did so partly in consequence of these publications, which could not have escaped their attention, as Mr. Krom's first imposing advertising pamphlet of 75 imperial octavo pages contains some 20 pages made up from my Colorado pamphlet and from the Engineering and Mining Journal, and very properly credited. Being thus prominently on the record as a volunteer, and without reward, or more flatly since Mr. Krom has never had a "mortgage" upon me, I am as free now to volunteer for the information of the mining public a review of what has been accomplished during eight years by some practical trials and several separating mills adopting the Krom machinery.

1.—The first practical employment of these air machines on silver ores was at Georgetown in 1870 by a Mr. Bement, whose small mill was burned down, and the data of its work, as published by Mr. Krom, never has stood an expert investigation.

2.—The first practical trial on gold ores was made at Central City in 1870. The results, published widely by the Colorado Herald, as given by Mr. Krom, failed to satisfy those at whose expense the trials were conducted. The results are to be found in my pamphlet, and partly embodied by Mr. Krom in his first "Description of S.R. Krom's system and machinery for dry crushing and concentrating ores."

3.—In 1871-2 a Mr. Nichols procured machinery and a contract for the territory of Utah. This machinery has never been operated on either by Mr. Nichols or by the purchasers at sheriff's sale.

4.—In 1873-4 some business men of New York furnished means for the erection of an experimental mill at Star Canyon, Nevada, which, after treating some lots of ore, was shut down, and has remained inactive since, as explained by Mr. Krom, because the mines of the vicinity were not developed, and the insufficiency of water.

5.—The results have never been given to the public. The contract required the erection of three mills, and whatever was the success or failure of this experimental mill it was tardily executed, at their risk, by engaging to supply the machinery, on limited test of saving 75 per cent., to the Manhattan Company, at Austin, Nevada. After a test run of the mill it remained mainly idle until a second test trial was made by Mr. Krom last year. His results, as published by him in the local paper, were satisfactory to himself, but failed to convince the company sufficiently to pay for the machinery or to continue running the mill.

6.—The second contract mill was erected by the White and Shilo Mining Company at Battle Mountain, the machinery supplied as before on a guarantee of 75 per cent. saving. After a test trial the mill was shut up until run by Mr. Krom last year. The company is now going through bankruptcy proceedings, the machinery unsettled for, and no reports.

7.—The third contract mill was erected by Messrs. Crook Brothers at Lake City, Colorado. After running some considerable quantity

of ore the payment of royalty was refused and subsequently compromised by reshipping all the concentrators back to New York, where they now lie in store subject to a largely reduced payment by Mr. Krom to effect their transfer into his possession again.

8.—The mill of the Clear Creek Company, at Georgetown, was erected in 1875. After running some time reports of treating from 6 to 8 tons per day have been made, the capacity being 40 tons per day. No data has ever been furnished respecting the saving.

9.—The successor of the last was erected by the Montana Mining Company, at Jefferson City. Favourable reports have been made of its running since its start in February, 1877, but no reports or data have been given, and there is rightly much reluctance to observe the contract or royalty, nothing having been paid unless very recently.

10.—Trial machinery was obtained last year by the Canada Copper and Sulphur Company. At considerable loss the two concentrators were reshipped to New York, and have lain in store for a year awaiting their redemption at a reduced price.

11.—A test machine with an outfit was procured by a Mr. Kersheed, of Fourteenth-street, and shipped to England last year. An expert chosen by Mr. Krom was sent from here, and after trial at Swansea the chief company concerned abandoned all idea of using the Krom system, and have adopted water dressing.

In despite of this unsatisfactory present condition, largely attributable to unsound business conduct, I have during the past six months proposed to interesting friends with capital sufficient to found a mill to treat experimentally a special deposit, trials having been made solely under my control with satisfactory results. This proposal was conditioned in case of a working success on obtaining subsequently an exclusive right to work or control all like deposits wherever found in the United States, my belief being that a close management, freed from the patentee's direction, with a *pro rata* royalty, and machinery furnished at actual manufacturers' cost, would re-establish the reputation of the machine. These terms had been discussed and agreed to substantially, but the execution of the detailed contract was deferred after I had interested others from time to time by Mr. Krom, until it became evident that the same bad faith, hitherto so disastrous in practice, was being used upon me and my friends, proceeding from a disregard of a business engagement entirely for selfish purposes. Had confidence remained this review of the situation would have been written only after the proposed experimental mill had failed to vindicate to the mining public the soundness of my judgment.

New York, Nov. 25.

G. W. BAKER.

#### FINANCE, MANUFACTURE, AND BRITISH MINING.

SIR,—Shareholders when unprotected by the law, or with their affairs administered and conducted by non-responsible directors—whether limited or unlimited—are as defenceless as a flock of sheep attacked by wolves, devoid of useful combination, and incapable of governing the business, or protecting their own interests. They are in the hands of trustees, and rarely enabled from the published accounts to estimate accurately their position, and the risks they are committed to; or, on the contrary, to estimate the security that exists for the continuance of dividends. In the case of the City of Glasgow Bank, with its 133 departments, we have an example of deplorable abuse; but it is not so much with this as the probabilities of other catastrophes with which we have to deal. From the columns of the Economist we gather that the published accounts of no less than 73 English and Welsh banks, with 1154 branches, show that there is £40,599,420, called up, and an accumulated reserve of £17,530,345—say £58,129,765—capital at command. These banks have in circulation:—

Notes	£27,390,448
Bills, acceptances, and drafts	12,508,912
Deposit and current accounts	235,392,087

Thus raising the total liabilities to the public and their shareholders to £33,421,212. To meet these outstanding liabilities the assets are as follows:—Cash in hand, money at call, £1,334,223, or just over 28 per cent. Investments in Government stocks wherein stated to be £7,318,003, say, 17 per cent. in addition. "Then comes the large sum of £10,393,129, absorbed in a portfolio of bills discounted, overdrawn accounts, loans, and varied unnamed securities ranking against the assets. Next comes buildings and sundries £4,375,857, which absorb the full sum of £33,421,212—i.e., paid up capital, reserve fund, notes in circulation, acceptances, bills, and commitments: the latter two sums amounting to £27,390,448, and to £12,508,912, respectively, are simply accommodation, and which amount together to within 700,000, of the entire paid up capital of these 1154 banks and their branches. To add to this there are 45 companies, which have 240 departments of business, publishing no intelligible balance sheets, or incomprehensible, according to the same authority, having a market value of £3,259,000, with a subscribed paid up capital £7,713,582, having a note issue of £1,270,788, which is simply accommodation paper. There are 1394 distinct parent and branch, limited and unlimited, joint stock banks throughout England and Wales.

There is something radically wrong in the principles and conduct of joint stock banking. Merchants and contractors are daily trading with borrowed money, which fosters a game of fierce competition instead of honourable and fair trading and industry, based on capital or the deposit of actual securities in the shape of commodities against advances. The discount of merchants' and traders' bills, without being backed by products represented, are no securities for bankers, as it is well known that in financial trading the operations frequently entail in paper the market value of the manufacturers or products four or five times over. Manufacturers, traders, and contractors not unfrequently lose their all, and their time into the bargain, which periodically paralysed the commerce of the country. Hence modern banking assumes all the risks—thence arises the collapse of such gigantic concerns as the Glasgow Bank, Royal of Liverpool, Barneds, and Overend Gurney and Co.

The hardening of prices, the scarcity of money, and continued depression in trade are, in our opinion, the primary causes of the existing chronic badness of trade, and the consequent unhappy position of all classes of society, including large masses of the working fraternities. These spring from the prevailing facilities of mercantile and manufacturing finance which have culminated in overstocked markets for our products. Hence the large sums of money entrusted to joint stock banks mainly consist in portfolios of bills discounted, multiplied in instances over and over again, so that in fact the banks sustain mainly the risks of trade and manufacture, which is trading speculation, instead of legitimate banking as conducted by our forefathers an age or two ago; for it must be remembered that joint stock banks have sprung into existence since the passing of the Reform Bill, in 1832, the repeal of the Corn Laws in 1840, and the introduction since that advent of the principles of free trade.

In our opinion the date is not far distant when the greatest panic ever experienced in this country will spring from the entanglement and the inability of joint stock banks to meet their engagements, and the inability of joint stock banks to meet their engagements, with There are in England and Wales 1394 banking establishments, with a paid up capital of £8,313,002, with notes in circulation amounting to £27,390,448, just 56 per cent. accommodation. The market value of these trading concerns is somewhere near £22,488,500. The investors in purchasing incur a risk of uncalled capital. Against £1,743,128, having an aggregate reserve of £17,530,345. Against this reserve there are bills, acceptances, and drafts outstanding at the date of the last returns of £12,508,912, and sunk in buildings and sundries £4,375,857, which together amount to within 645,576, of the reserves. Again, investors can secure on an average barely 5 per cent. interest, possess simply trading concerns having the profits exhausted each half-year, whilst the basis of security rests alone on future business, the nature and character of which, proprietors know nothing of with any approach to certainty, control, and are wholly in the hands of non-responsible directors. To hold shares in unlimited joint stock banks under the conviction that they are as secure as Indian stock, railway debentures and preference stocks, colonial Government bonds, and sound industrial undertakings is as fallacious and absurd as the estimate and comparison of British Consols and Spanish Bonds upon the same principle.

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ple and standard of security. We are much mistaken if the collapse of the City of Glasgow Bank does not call upon the Legislature to ensure Government supervision in auditing accounts and estimating assets, that other disclosures will follow, and prove that joint stock finance, not banking, is in principle and results as slippery as an eel, and as treacherous as a quicksand.

R. TREDINNICK AND CO.,  
Dealers in Stocks and Shares.  
Union-court, Old Broad-street, London, Dec. 2.

P.S. (Dec. 12).—In corroboration of our views on modern finance and banking, as pursued by joint-stock banks, and expressed in our letter addressed to you on the 2nd inst., we have in confirmation of our arguments to state that the possession of simply four shares, held by the Caledonian Bank, in the City of Glasgow Bank led to the suspension of the parent and 23 branch establishments. Following in the course of these calamitous suspensions, we have to record the collapse of another aspiring bank, with no less than 49 branches in the West of England and South Wales.

Paying due regard to the published balance sheets of these two companies, no one could for a moment conceive the immediate grief to which their shareholders are subjected, and if such results follow as in these cases what security have we against the other joint stock companies and their thousand branches, and whose accounts may be founded on a basis equally misleading and speculative in character.

The foregoing facts corroborate our views that independent accounts are necessary in estimating assets and balancing liabilities in all joint-stock banks. In the case of the Bank of England we have weekly statements of liabilities and assets. But in regard to most of the limited and unlimited joint stock banks they are trading discount companies, and not, in the general acceptance of the term, legitimate banking institutions.

It is a well-known fact that these exceptional concerns possess 300,000,000, sterling of the surplus capital of the backbone of trade, manufacture, mining, and constructive enterprises associated with the home industries of the Mother Country; we, therefore, again reiterate that, as confidence is the breath which supports their credit, non-responsible directors and executives should be supplemented by Government supervision, or otherwise we shall have a financial panic, which will shake the very foundations of what we contend to be the false position of our present system of joint stock banking finance. It is known that 250,000,000, of bills and loans have been made by these companies. This money must, consequently, be absorbed, and the recouping of which depends entirely upon the realisation of products. Should the hardening of prices, the contraction of trade, and value of commodities, manufacture, and other products leave no margin in favour of borrowers, then the whole risks will have to be sustained by the banks. We at the same time can, by reference to the Economist and the Stock Exchange Monthly List, ascertain at a glance the margin of paid-up capital and reserve funds existing in support of the whole fabric.

A CONTRAST—OR WHICH PAYS BEST?

SIR,—I append two trading accounts. The formula agrees with the test we apply to the affairs of our mines and other trading concerns. The amounts are from Board of Trade Returns, and the mean of estimates by our greatest authorities upon income and labour.

I think it will be apparent to the majority of your readers that Free Trade in practice has proved itself a great bubble, and that it will soon break with terrible consequences. W. T. CORNWALL.  
Birmingham, Dec. 12.

FREE TRADE.

GREAT BRITAIN AND IRELAND'S TRADE ACCOUNT, 1854 TO 1876 INCLUSIVE.			
Dr.	Millions.	Cr.	Millions.
Goods bought (imports) .....	6,070	Sales (exports) .....	4,833
Wages, salaries, rents, and profits, being estimated aggregate income .....	11,500	Ditto to people home account, for their subsistence .....	11,500
Paid interest and profits on investments by foreigners, and John Bull's travelling expenses .....	100	Less estimated savings .....	575
Naval and military expenditure and embassies spent abroad .....	230	Received interest and profits on capital invested abroad, and receipts from embassies and foreign travellers .....	200
Bad debts .....	240	Gross deficiency .....	2,032
Less contra imports .....	150		
Total .....	17,990	Total .....	17,990

PROFIT AND LOSS ACCOUNT.

Dr.	Cr.
Stock, 1854 .....	Savings brought from trade account .....
Gross deficiency, 1876 .....	Stock, 1876 .....
	Additions to ditto, comprising railways, ships, docks, public works, and dwellings .....
	Balance net deficiency .....
Total .....	Total .....

PROTECTION.

FRANCE TRADE ACCOUNT, FIFTEEN YEARS, ENDING 1876.			
Dr.	Millions.	Cr.	Millions.
Goods bought (imports) .....	1,863	Sales (exports) .....	1,895
Wages, salaries, rents, and profits, being estimated aggregate income .....	9,000	Ditto to people home account, for their subsistence .....	9,000
Naval and military expenses (ordinary), and cost of embassies spent abroad .....	60	Less estmd. savings .....	8,325
		Receipts from foreign travellers and embassies .....	45
		Gross deficiency .....	658
Total .....	10,923	Total .....	10,923

PROFIT AND LOSS ACCOUNT.

Dr.	Cr.
Stock, 1862 .....	Savings from trade account .....
Gross deficiency, 1876 .....	Stock, 1876 .....
German war indemnity and foreign subscription to loan acct. .....	Addition to ditto .....
Balance net surplus .....	
Total .....	Total .....

THE GREAT NORTHERN RAILWAY.

SIR,—The failure of the West of England and South Wales District Bank following so rapidly upon that of the City of Glasgow Bank, the liquidation of the Caledonian Bank, and the delinquency of the Capital and Counties Bank, ought to make a deep impression upon all investors in railways, in the management of which they have surrendered their will, judgment, and power of independent action—in very fact, are at the mercy, in too many cases, of men acting upon principles diametrically opposed to those prevailing, or rather rendered dominant, in private industrial or commercial undertakings. The general manager of the Midland Railway truly stated to the Royal Commission on Railways in his reply to Question 16,927: "It is the sea competition to which the Great Eastern is subjected that puts that company in their deplorable state;" and as it is equally true that "qui se ressemble, s'assemble," or in our vernacular English, "birds of a feather flock together," in which sense the Great Northern, in their 'pending parliamentary campaign, are making common cause with the Great Eastern after disburdening themselves of so much treasure, in this same year's pitched battle on the very identical matter—the coal transit from Yorkshire to London. The general managers of both companies gave evidence this year that they could not compete with seaborne coal, the chairman of the last-named company stating that "seaborne coal prevented their traffic by rail." Yorkshire, Nottinghamshire, and Derbyshire coal, it has been shown in my preceding correspondence, can be delivered, via Keadby, seaborne into consumers' premises in the Metropolis at a minimum of 5s. per ton under the cost per rail from the pit's mouth, in both cases with attendant expenses; and if we take into account return goods from London to, and vice versa from, the combined manufacturing districts at less than a moiety of cost per Great Northern, said saving of a moiety of the transport cost per rail after defraying picking up, sea-freight, rail toll, and delivery charges, we arrive at an augmented saving.

Great Northern shareholders will please observe that ample—nay, exuberant—data will be placed at the disposal of themselves and their experts, so that they may be penetrated with the unqualified conviction that such result is not arrived at by the undersigned on the principle of action by their company, their general managers publicly stating their inability to tell (sic) the working expenses

of coal traffic on their line. The Report of the Royal Commission on Railways, page 44, shows the appalling state of the system pursued in the audit of railway accounts, and the bank delinquencies set forth in my correspondence are to be attributed to the "Fleau moral" of incapacity and mal-administration. Great Northern shareholders I implore you to learn a lesson from what is passing before your eyes, and to demand a thorough investigation, and if that be refused sell out. Do not be cajoled with the "chuchotement officiel" that the undersigned is bereft of originality of thought, mental insight, capacity to grapple with technical, financial, and commercial, incipient and summarised, "comptabilité." He is no stranger to your undertaking, having had conferences with your directors, accompanied by your general manager and secretary, at King's Cross and at Doncaster. I am prepared to prove from your last printed statement of accounts that with the displacement of the precited traffic to Keadby and Seaborne to London, and vice versa, and to destination, not a farthing will be left for distribution to the ordinary shareholder. As to your assets, what do you expect to realise for your 300,000, London, Chatham, and Dover transaction? What will become of your coal invasion lines into Notts and Derbyshire? Your goods traffic to Manchester, Leeds, and the manufacturing districts will be taken from you by daily departures from each end.

As to your Cheshire lines it is supererogatory to supplement my last week's letter. As to your Perpetual Preference Capital, Consolidated Non-Contingent Perpetual Preference Stock, Consolidated Contingent Perpetual Preference Stock, Preference Stock of 1876, and Preference Stock of 1877 dividend to accrue from July 1, 1879! Consolidated stock (Leeds, &c.) railway look ahead. Many ships have founded lately through want of a "look-out." As to your Sutton Bridge Dock investment, coal can be put on board ships discharging there cheaper in Boston Deep than at Sutton Bridge Dock. In this alarming state of commercial collapse it is the duty of Great Northern shareholders to take action.

WILLIAM JOSEPH THOMPSON.

Fitzwilliam-road, Clapham, Dec. 11.

ROCK-DRILLING MACHINERY.

SIR,—From the incessant importunities of Mr. Edwards we for the last time answer him through the Journal. From the lucid explanations given by us in your issue of Nov. 30, we should have thought that Mr. Edwards would have sufficient discretion to abstain from any further remarks; but, as your readers will readily perceive, he is foolish enough to imagine that we shall at some future time follow in the steps of Messrs. Schram and Dunn. If he thinks so he is fatally mistaken, but on the contrary any further repetition of his false remarks will cause us to take steps to protect ourselves, and compel him to prove the truth of his assertions. We tell him for the last time that there is no similarity between the Eclipse and Edwards' drills, and consequently not so in their specifications. Mr. Edwards can make as many drills as he pleases from his patents of 1874 and 1875, but in doing so he will not be making anything like the Eclipse drill. We are also satisfied that Mr. Edwards does not understand the structure of the Eclipse drill, and we scarcely think his own, for we again repeat that his valve is governed by the live steam and not by the exhaust.

Mr. Edwards would, perhaps, like to see some other person do what he has not the courage to do himself—to attempt to make the Eclipse drill. We are perfectly satisfied of the validity of our patent, and are prepared to uphold it against the world, and any clap-trap Mr. Edwards may have said or wish to say will not deter us from carrying into effect the warnings we have already given. London, Dec. 10. HATHORN AND CO.

ROCK-DRILLING MACHINERY.

SIR,—Perhaps unknown to himself Mr. Edwards has answered the questions I put to him. I now know positively that he not only never made a rock drill with a valve like the Eclipse, but that he never conceived the idea. His twaddle in last week's Journal must go for what it is worth, certainly not the paper it was written on. As to the model he pretends to have made, I defy him to produce it. Wandsworth, Dec. 12. WM. THOMPSON.

ROCK-DRILLING MACHINERY.

SIR,—Kindly insert a short note in reply to Mr. Edwards' side-wind of last week. That very clever gentleman would like to make your readers believe that no other person but himself is any judge of inventions or their designs. My experience is not by any means confined to the Eclipse drill, for I am quite sure that my knowledge of such machines dates back much further than that of Mr. Edwards, and certainly is of a more permanent character, as I am fully convinced that his knowledge is founded upon paper, not practice. I commenced in the United States with the Burleigh, and it was there I first saw the Ingersoll, which I again saw in this country on my return three years ago, since which time I have had opportunities of seeing nearly all the drills that have been offered to the public, among them being the Eclipse and Edwards' drill, the latter as exhibited at the Victoria Docks. Again I say that there is no similarity between the two drills, and however much Mr. Edwards may try to shield himself from the accusation of taxing other people with pirating his ideas, that fact still remains. As to bringing his drill before the public in his own fashion, I do not see that anyone has attempted to prevent him doing so, but still he cannot shut people's eyes as to his intentions in regard to other rock-drill proprietors. It looks bad, to say the least of it. GEORGE COOK.  
Mildred, Dec. 10.

ROCK-DRILLS AND AIR-COMPRESSORS.

SIR,—In my letter of Nov. 27 I said nothing that I believed to be untrue—in fact, on inference I still assert it despite the remarks of Mr. H. Williams and Mr. Henderson.

If the Brydon and Davidson's machine were a new one, why did not Mr. Williams tell your readers the machine had neither been opened or examined for 12 months, and that the packing was altogether out of place, and prevented its working?

The second contradiction I give Mr. Williams is that as Mr. Hosking who showed the McKean said before the machine started—"I brought this machine here to let the people see a McKean's drill which has done a lot of work, not that it is fit to exhibit." The Barrow had equally done a lot of work, and never was intended as a competitive trial, and there was none. The stones in the ground have been examined by two gentlemen well able from experience to judge of the comparative hardness since the trials, and they can see no difference—in fact, they were taken from the burrows for their size, as affording a steadier base to operate upon, and not for any difference in hardness or softness. There was no difference in the quality, and none but a novice or one anxious to misrepresent facts would assert it.

Every borer or chisel except the Eclipse drilled a hole exceeding 1 1/2 in.; the borer of the Eclipse was much smaller, diminishing as every child knows in its downward progress. Mr. Williams' statements are alike true throughout and of a piece when he says—"H. W." is either the proprietor of some rival machine, or strangely interested in one." False throughout. "H. W." has no interest in any machine direct or indirect. His interest is to see fair play, and good machines not condemned by pretentious "toys" and small bellows compressors at extortionate prices.

Mr. Henderson, in his blindness of first love, tells us they drove nearly 7 fms. during the first month. He does not say that there are men who would have driven the ground during that time at 6l. a fathom, and at no time during the 7 fms. driving has the ground exceeded 9l. per fathom. That they with their pretentious Eclipse have not exceeded hand labour. Mr. Henderson and his friend Williams are alike ignorant of what is doing at New Cook's Kitchen, where Ullathorne is driving 3 fathoms a week. Of one we hear nothing, but the other would not be heard, save as a barndoor fowl crowing on his own dunghill. That the Eclipse drill has proved its resistance to wear and tear by the hard ground in West Basset is the greatest twaddle one can be asked to hear. They have had nothing like hard ground yet.

"H. W." has no desire to prejudice any machine, but has taken an interest in machines years before Mr. Henderson saw one. It is the unqualified pretensions to superiority, to the condemnation of superior machines, that "H. W." has entered his protest as a warning to the adventurers who may entertain the question of boring machinery. They who feel an interest have only to go to Dolcoath, Carn Brea, Wheal Agar, South Crofty, or West Tolgus to determine which is like business. The most inexperienced miner in Cornwall will tell you which is the toy and which is the useful machine; the latter will bear comparison with the costly toy and bellows so much lauded.—Dec. 11. H. W.

DEVON SILVER-LEAD MINE.

SIR,—I beg to say, in reply to your correspondent "C.E." that the valuable lode in the Devon Silver-Lead Mine is not, I believe, bounded by the measurements I gave, but as I always prefer understating a case of this nature, I gave the known rather than venture on a statement of the unknown, and in this instance the facts I have given so fully demonstrate the immense value of the mine that it is not a material question whether the lode is or is not many fathoms more. The lode I described has been bared, and only wants winning. I have received a letter from another gentleman, who is surprised at the statement about the quantity of lead and silver in the halvans. It certainly does seem to any outsider an incredible thing that so much valuable mineral should be lying in the halvans, but inasmuch as a considerable part is not patent to the eye until the stuff is washed, and from the fact that the mine has yielded so much produce, we know miners often throw away valuable mineral, and in large quantities, when they have plenty of bulk to take at. The other lodes to which I incidentally referred, and which I assigned with the machinery to be put up by a company, as a bonus, will in all probability be as productive as those which have been worked. I think it is only fair and right that the purchasers of this mine should have every advantage given them on a liberal scale. Of one thing I am certain—that on the revival of trade, and when the halvans and lode have been dealt with, the purchasers, if inclined to resell, will have no difficulty in realising twice or three times the amount of 5000l.—the present purchase price. In dealing with the halvans I have estimated the lead at 1 1/2 ton per fathom instead of 2 1/2 tons. The silver I have estimated at 20 ozs. per ton instead of the immense percentage shown by the careful assay which was made. Here again is an element which I think a spirited purchaser should have the benefit of, and "C.E." will at once see that I have thrown to the purchasers far more in value than the price asked. The Devon Silver-Lead Mine is a sound and healthy adventure, and whoever becomes the fortunate possessor will, I am sure, find ample confirmation of everything I have stated.

If your correspondent "C.E." has any further questions to put I shall be happy to give him every information. Much injury has been done in the past to mining matters by exaggerated statements and selling mines at too high a price. The seller is entitled to a fair price, but it is the worker and developer of the mine who should have the lion's share. By this means mining would be put upon a sound and healthy footing. Success in this, as in every good mine, would inspire public confidence, and we should soon hear less of winding up. Let the character of a mine never be over, but under, stated, and then personal inspection will invariably confirm what has been stated. As several of my friends have written to me on the subject, assuming me to be the writer, I will, with your permission, drop the *nom de plume* for the future, and subscribe my name.—Ulverston, Dec. 11. WILLIAM SALMON.

DEVON GREAT CONSOLS.

SIR,—In referring to recent events in connection with the above mines I stated in my last letter to the *Mining Journal* that "throughout the conflict between the authorities of this company and the men, with regard to the five-weeks month, the full working expenses were constantly brought prominently forward, whilst the great reserves of manufactured arsenic were kept in the background, and that the mines were represented as being worked at an enormous loss; when, at the same time, it was clear to the men on the mines, and to those residing in the district who witnessed the large accumulation of this valuable commodity in store, that, calculated at the ordinary market price, the mines were plainly working at a good profit." In confirmation of this statement it was officially announced at the recent meeting of the company that the stock of arsenic had been sold, and that the money borrowed, amounting to 6000l., would be paid off. To discharge this balance of 6000l. the sale of about 1000 tons of arsenic will probably be required; but, as the aggregate stock in the company's store must far exceed this quantity, it is clear that these famous mines enjoy a good commercial position, and have up to the present time passed through the panic with a good balance on the profitable side of the account, and, all things considered, there can by no means be any real cause for bewailing.

The remarks of Mr. Stewart, in the Journal of last week, are characterised by such a peculiarity of thought and an eager desire for revolution as to altogether overwhelm any good that otherwise might have appeared. It may possibly happen to be that he is sufficiently qualified to judge of the minute details of the requirements of such an establishment from a mere perusal of a cost-sheet. It may not, however, be amiss to remark that any ordinary correspondent found publicly dictating the number of pit and timber men, masons, smiths, carpenters, &c., required in such an extensive range of mines as the Devon Great Consols, without a full knowledge of the extent of operations, would certainly lay himself open to the charge of being a man of no little presumption and self-esteem. In forming a judgment on the question of expenses the natural course to adopt will be a comparison between the costs of Devon Great Consols and other great mines in the West. As an example, the three following leading mines in the county of Cornwall may be taken with their monthly costs:—

Dolcoath .. .. .	(about) £4000
Carn Brea .. .. .	3500
South Crofty .. .. .	2200

The expenditure of the Devon Great Consols, it appears from recently-published accounts, does not reach that of the above two first-mentioned mines; it, therefore, seems a difficult matter for any practical man to understand how "enormous reductions" can reasonably be made, especially when it is remembered that besides raising and sampling from 700 to 800 tons of copper ore there is an extensive manufactory on the mines, producing from 150 to 200 tons of refined arsenic per month. Let us have suggestions that are logical and feasible; they can then be considered. The principle mooted by Mr. Stewart that "mines not enriching the shareholders should be stopped" would, if unfortunately adopted in Cornwall, have the effect of causing an almost entire suspension of mining operations throughout the county, and the industries population would be cast upon the world in a state of penury and want. Happily the noble example of the mining authorities in the West forms a pleasing contrast to the ruthless desire of Mr. Stewart.  
London, Dec. 12. A MINE ADVENTURER.

DEVON GREAT CONSOLS.

SIR,—During the present controversy with regard to the management of the above mines it may be interesting to the readers of the *Mining Journal* to peruse the following description of the property, given by the British Association during their visit to the mines in the year 1877. On that occasion many hundreds of visitors went over the surface workings, and were much struck with the powerful machinery, the extensive dressing-floors and appliances, the arsenic works, and the railway to Morwellham, a quay on the River Tamar, along which line the scenery above the Morwell rocks and the river is wonderfully fine.

At the present moment it is due to the officials of the company to mention that on the visit referred to Dr. Gladstone, on behalf of the Association, and in return for the courteous attention they had received, expressed his admiration of the skill, energy, perseverance, and forethought displayed by the agents in the arrangement of the works, the erection of the machinery, and the development



EMMA SILVER MINING COMPANY (Limited).—At the meeting of this company on Tuesday the chairman gave full particulars of the various law proceedings and projects. He said that before a month they would hold a judgment against one of the promoters for 200,000*l.*, and that sufficient funds would be realised to pay off 27,000*l.* of debentures and to afford a dividend of 1*l.* or 2*l.* per share.

THRASIS SULPHUR AND COPPER COMPANY (Limited).—At the extraordinary meeting of this company, on Tuesday, the series of

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resolutions for a fusion with the French company of Victor Mercier and Company, of Paris, were unanimously adopted. The chairman said the main features of the arrangement are that the company get rid of a royalty forming a first charge on their income and assets, and amounting to 60,000*l.* a year. Secondly, that they become the owners of the mines, and can work them in the way they deem best, and with a freedom not permitted under the previous lease. In exchange for these advantages they take over the capital shares of the French company at the price fixed in their Articles of Association—10*l.* per share. This involved a payment of 194,240*l.* These capital shares were originally 22,500 in number, but by annual drawings have been reduced to 17,424. They represent the actual expenditure of the French company on the works, buildings, and plant, and also on the open-cast and general development of the mines both at Tharsis and Calanas, and further, the capital outlay involved in acquiring the fee simple of about 18,000 acres of land contiguous to the mines—a large perimeter being necessary to protect us against claims for smoke damages, to which companies are liable in Spain, very much as in this country. Secondly, the French company is taken into partnership by converting their jouissance shares into Tharsis shares, giving one Tharsis share for two of the old ones. The Tharsis capital will be in the ratio of 1,311,600*l.* Five per cent. dividend on this would amount to 65,830*l.* As the royalties amount to over 60,000*l.*, the French company is practically giving up a 5 per cent. preference security over the whole share capital of the Tharsis, and merging the same in the ordinary stock of the joint undertaking. Among the assets handed over by the French company there will be about 16,000*l.* in cash, 250*l.* in the form of a creation of 150,000*l.* of Tharsis debentures, the revenue of the French company for the year 1877 of 71,502*l.* consisted of royalties 65,831*l.*, about 1500*l.* unclaimed dividends, and a balance of about 4000*l.*, which latter will not occur again. This balance represents dividends on a certain number of jouissance shares which were never allocated, but the dividends on them were set aside annually, and the amount carried to a fund of profit and loss, and became part of the divisible balance of the next year. The expenditure of the French company, 10,257*l.*, will in 1879 be reduced to about 8000*l.* It consists entirely of life rents to the joint, and consents, and officials of the company, which will in course of time cease. The lawsuits taken over were of a very trifling nature, and such as need not occasion the slightest uneasiness. The result of the arrangement is a fair and equitable one, likely to conduce to the welfare of both companies.

Per share.	Paid up.	Rate per cent. per annum.	Description of shares.	Last price.
410	28	7	COAL, IRON, STEEL.	90s.
10	10	10	Ararat Coal (Limited) .....	20s.
10	10	10	Benhar Coal (Limited) .....	50
10	10	10	Bolckow, Vaughan, and Co. (Lim.) ..A.	55s.
10	10	10	Cairnabie Gas Coal (Limited) .....	60s.
10	10	10	Chillingham Iron (Limited) .....	77s. 6d.
10	10	10	Clyde Coal (Limited) .....	55s.
10	10	10	Ebbw Vale Steel, Iron, and Coal (Lim.) ..	30s.
10	10	10	Fife Coal (Limited) .....	40s.
10	10	10	Glasgow Port Washington Iron & Coal (Lim.)	40s.
10	10	10	Ditto Prepaid .....	40s.
10	10	10	Locheore and Caple (Limited) .....	30s.
10	10	10	Marbella Iron Ore (Limited) .....	15s.
10	10	10	Monkland Iron and Coal (Limited) .....	40s.
10	10	10	Ditto Guaranteed Preference .....	20s.
10	10	10	Nant-y-Glo & Blaenau Ironworks pref. (L)	2s. 6d.
10	10	10	Omoa and Cleland Iron & Coal (L & Red.)	35s.
10	10	10	Scottish Australian Mining (Limited) .....	16s. 3d.
10	10	10	Ditto New .....	60
10	10	10	Shotts Iron .....	5s.
10	10	10	COPPER, SULPHUR, TIN.	5s.
10	10	10	Canadian Copper and Sulphur (Lim.) ..	29s.
10	10	10	Cape Copper (Limited) .....	15s.
10	10	10	Glasgow Carradon Copper Mining (Lim.) ..	12s. 6d.
10	10	10	Ditto .....	20s.
10	10	10	Huntington Copper and Sulphur (Lim.) ..	52s. 6d.
10	10	10	Panuco Copper (Limited) .....	13s.
10	10	10	Rio Tinto (Limited) .....	14s.
10	10	10	Ditto, 7 per cent. Mortgage Bonds ..	21
10	10	10	Do. 5 p.c. Mor. Deb. (Sp. Con. Bds.) ..	14s.
10	10	10	Tharsis Copper and Sulphur (Limited) ..	5s.
10	10	10	Ditto New .....	15s.
10	10	10	York Peninsula Mining (Limited) .....	11
10	10	10	Ditto, 15 per cent. Guaranteed Pref. ..	7s.
10	10	10	GOLD, SILVER.	7s.
10	10	10	Australian Mines Investment (Limited) ..	11
10	10	10	Richmond Mining (Limited) .....	7s.
10	10	10	OIL.	7s.
10	10	10	Dalmatians Oil (Limited) .....	38s.
10	10	10	Oakbank Oil (Limited) .....	11s.
10	10	10	Ditto .....	87s. 6d.
10	10	10	Uphall Mineral Oil (Limited) "A" .....	10
10	10	10	Ditto "B" Deferred .....	15s.
10	10	10	West Calder Oil (Limited) .....	12s.
10	10	10	Young's Paraffin Light & Mineral Oil (L.)	22s.
10	10	10	MISCELLANEOUS.	22s.
10	10	10	London and Glasgow Engineering & Iron	8s.
10	10	10	Shipbuilding (Limited) .....	9s.
10	10	10	Phospho Guano (Limited) .....	71s.
10	10	10	Scottish Wagon (Limited) .....	Per share.
10	10	10	Ditto New .....	For six months of 1878.

NOTE.—The above lists of mines and auxiliary associations are as full as can be ascertained, Scotch companies only being inserted, or those in which Scotch investors are interested. In the event of any being omitted, and parties desiring a return for them and such information as can be ascertained from time to time to be inserted in these lists, they will be good enough to communicate the name of the company, with any other particulars as full as possible.

J. GRANT MACLEAN, Stock and Share Broker.

Pat Office Buildings, Stirling, December 12.

## Registration of New Companies.

The following joint-stock companies have been duly registered:—

**CLIFTON IRON COMPANY (Limited).**—Capital 25,000*l.*, in shares of 5*l.* To carry on the business of iron smelting, iron and steel manufacturing, iron casting, forging, and rolling, and iron and coal mining in all its branches, and the making, buying, and selling all articles connected therewith. The subscribers (who take one share each) are—C. Wigg, Lincoln, alkali manufacturer; T. N. Bird, Liverpool, merchant; A. P. Fletcher, Liverpool, solicitor; P. Speakman, Runcorn, shipbuilder; W. Batt, Runcorn, merchant; T. Norman, Runcorn, manufacturer; W. Griffith, Runcorn, wholesale grocer.

**UNION TRUST (Limited).**—Capital 100,000*l.*, in shares of 10*l.* To carry on in Great Britain or elsewhere the buying, selling, or dealing in mortgages, debentures, securities, exchanges, specie, &c. Receiving deposits of money, securities, and valuables, negotiating and making loans, &c. The subscribers (who take one share each) are—P. W. S. Ross, 24, West Cromwell-road; W. H. Harrison, Hounslow; T. Thompson, jun., 1, Palmerston Buildings; W. H. Lethbridge, Marlborough-road; C. Russell, Peckham; H. Francis, Selhurst; A. Schloss, 40, Rathbone-place.

**BANGOR PEOPLE'S CAFE COMPANY (Limited).**—Capital 4000*l.*, in shares of 1*l.* To establish houses, rooms, stalls, &c., in and around Bangor, and to carry on the business of refreshment house keepers. No wines, ales, or spirits to be sold. The subscribers (who take 20 shares each) are—E. T. Edwards, Bangor; M. Roberts, Bangor; L. H. Anson, Bangor; K. W. Douglas, Bangor; H. Bagin, Upper Bangor; J. E. Roberts, Bangor; R. Dorkins, Bangor; J. Thomas Bangor; E. H. Ellis, Bangor.

**HULL WAGON WORKS COMPANY (Limited).**—Capital 25,000*l.*, in shares of 5*l.* To build, manufacture, and repair railway and all other wagons, trucks, vans, tramcars, &c., and to dispose of same. The subscribers are—H. Willford, Hull, 20; J. Ross, Hull, 20; T. Fawcett, Hull, 20; H. Smith, Warrington, 20; W. S. Rowson, Hull, 5; J. Harding, Hull, 30; J. Jacques, Hull, 20.

**WIDCOMBE BRIDGE COMPANY.**—This company was originally registered on October 7, 1862, and is now registered under the Limited Companies Acts by a special resolution.

**ABERYSTWYTH COCOA HOUSE COMPANY (Limited).**—Capital 4000*l.*, in shares of 1*l.* To establish houses, rooms, stalls, &c., in Aberystwyth, and to carry on the business of general refreshment house keepers. No wines, ales, or spirits to be sold. The subscribers are—D. J. Davis, Aberystwyth, 50; J. Jones, Bridge End, 50; W. Bubb, Aberystwyth, 10; T. Owens, Aberystwyth, 10; E. Edwards, Aberystwyth, 25; G. Green, Aberystwyth, 25; R. Jones, Aberystwyth, 10; J. Evans, Aberystwyth, 40.

**MATLOCK BATH HOTEL COMPANY (Limited).**—Capital 40,000*l.*, in shares of 10*l.* To carry on the business of hotel and tavern keepers, wine and spirit merchants, &c. The subscribers are—J. F. Wieland, Matlock Bath, 500; R. Almond, Palace Chambers, Westminster, 1; T. Wieland, St. Martin-le-Boulogne, 1; B. Barker, Matlock Bath, 1; W. H. Goodered, Matlock Bath, 1; W. G. Haig, Palace Chambers, Westminster, 1; W. Gibson, 3, Bridge-street, 1.

**ANGLO-AMERICAN LAUNDRY SOCIETY (Limited).**—Capital 5000*l.*, in shares of 5*l.* The purchasing of a valuable patent of machinery for washing, and the goodwill, plant, and fixtures of an existing laundry business, and working such business. The subscribers are

—E. C. Downing, Battersea, 2; J. Cloke, Chelsea, 1; E. Bates, Bloomsbury, 1; P. L. Walsley, Hamme-smith, 50; C. Griffin, St. Dunstan's Buildings, 5; W. Paussey, 334, Strand, 10; P. Phelps, Westo'-super-Mare, 1.

**OFFERING ESTATES COMPANY (Limited).**—Capital 40,000*l.*, in shares of 10*l.* To acquire the properties and business of the Swedish Iron, Rolling Stock, and Implement Works (Limited), and to let, lease, or carry on the business. The subscribers (who take one share each) are—F. E. Smith, Sheffield, 9; Victoria Chambers, 8; H. W. Elliott, Enfield, 4; J. Warden, Birmingham; H. Kimbe, 79, Lombard-street; J. Taylor, Birmingham; D. S. Hasluck, Wandsworth.

**C. W. MEIER AND COMPANY (Limited).**—Capital 50,000*l.*, in shares of 10*l.* To purchase the premises in Gracechurch-street and Bethnal Green-road, the interest therein, and the goodwill of the business of an india-rubber, gutta-percha, oilskin, and tarpaulin manufacture, belonging to C. W. Meier. The subscribers (who take one share each) are—C. W. Meier, 83, Gracechurch-street; W. Brooks, 62, St. Martin's-le-Grand; C. B. Williamson, Hancock-road; S. N. Thompson, Manchester; W. Johnson, 87, Gracechurch-street; W. Claridge, Brixton; J. C. Fuller, 547, Old Ford Road.

## Meetings of Public Companies.

### NEW QUEBRADA COMPANY.

The ordinary general meeting of shareholders was held at the Cannon-street Hotel, on Tuesday.

The Hon. T. C. BRUCE, M.P., the Chairman, presiding. The notice calling the meeting was read by Mr. N. G. BURCH, the secretary.

The report of the directors was taken as read.

The CHAIRMAN said: Gentlemen, I shall proceed to make a few observations before moving the adoption of the report and accounts submitted to you. Before doing so, however, I think I feel bound to make some explanation to you as to how it happens that I am occupying this position to-day. Some time ago during the summer some gentlemen whom I have been very long acquainted with, both from personal friendship and in business matters, requested me to join the board of this company; before doing so I ascertained that their interests and the interests of the public were identical, and that in so doing, while retaining their friendship, I could act freely and independently upon this board, and under those circumstances, I did consent to the wish they had expressed. (Hear, hear.) I have no claim for confidence at your hands at present; it remains to be seen whether that confidence will be justified; all I can say is that, as far as it is in my power, while I hold a seat at your board, I shall do all I can for the benefit of the company and its progress. (Cheers.) Now, to turn to the more important matters which we have to deal with, in considering the affairs of this company, it appeared to us that its progress and its development depended upon two things: one was the increase of the mine itself, and the opening up of those parts of it which had not yet been thoroughly investigated, and which, we believe, contain large deposits of ore, and we hope we are justified in this belief; the other, and hardly less important matter, was the securing of the most advantageous terms and means of transmitting our produce to this country. We have during the time under review in this report steadily worked on those two lines. The investigation of the mine itself has been carried out, as you will see in detail in the report, to a very considerable extent. I need not go over those details, because they are of a somewhat technical character, and it is probably easier to understand them from reading the report than from any verbal explanation I could give. The sum of the result is this—that we have pushed our investigations as rapidly as our means would permit, have opened up a very considerable part of the mine, and the parts which we have reached have been opened up have justified us in believing that we have very rich deposits there. Of course, I need not tell you that it takes a very considerable time to develop a thing of that kind, and we can only say that we have made considerable progress, and in so far as we have done so we have had no reason to be disappointed with the deposits we have met with, and the circumstances of the lode which we have come in contact. I might particularly refer to one point, which is, that in the north end of the lode we have found that the ruby ore dips, and, therefore, we have before us in the lower levels a larger mass of ore than we expected to find there. That, of course, is on the average our most valuable ore, and therefore, the finding of a large unworked deposit is a considerable advantage. In other parts we have had to deal with ore of various qualities, some poor and some of considerable value. In some places even we have found yellow ore—I do not say much—which for some time was supposed to be inferior, and was at one time scarcely thought worth working, which contain a percentage of copper almost equal to the ruby ore, and we have reason to believe that this yellow ore under proper conditions will turn out as important and valuable a property as the other. On the whole, we have reason to be satisfied with the results of those explorations, and it is our intention to continue them in the same line which we have hitherto adopted. In addition to this, as you will see from the report, the supply of ore from the mine has very considerably increased both in quantity and certainly in quality. Since the report was written this increase has still continued. We cannot say—because I think it is very imprudent to commence prophesying—what the future is going to bring for us, but we have reason to believe and hope that that increase of ore sent to this country will continue, and it may soon bring the affairs of the company into a very different position to that in which they are now. (Hear, hear.) I may also add, on this branch of the subject, that we have reason so far to be entirely satisfied with the conduct of our superintendent—Mr. Holman. He seems to be a man of ability, and a very hard-working man; and we have every reason to hope and believe that in his hands the mine will receive the utmost possible development. The next point we had to look to was the means of communication from the mines to this country. I need not go over the circumstances connected with the formation of the Bolivar Company, nor need I refer to the arrangement (which is now coming to an end) for this year. That was done some time ago. We have been in communication with the Bolivar Company with the view of altering that arrangement and making a new one for the next year. The object we have in view in making this arrangement is principally to secure the facility of sending ore of any quality, long or short, to the market, and in so doing, sending it by the railway, without any restriction as to percentage, and without restrictions as to the quantities of the different kinds we have to send, because in working a mine the quality of the ore will vary at times, and we wish to leave our hands free to send all the ore which we think would give us a return without any restrictions upon the part of the railway company. In order to effect that object the arrangement we made was the following (as you will see in the report):—The condition we made was that the minimum sum which we should pay the Bolivar Railway Company should be 30,000*l.*, and the arrangement with them is that we shall pay to them up to 30,000*l.* the proceeds of the ore as it arrives, and that the balance of the sum which we send to them in their minimum rate of 30 per ton upon any quantity of ore we like, or which we should expect to leave us a profit. But there is a condition precedent to this which seems to me of great importance, and that is, that in estimating or deducting the proceeds of the ore when arrived here, in payment of the Bolivar Company, there is, in the first place, a deduction to be made by us of 40s. per ton, which is to go to the expense of the ore and its different charges. We believe that on the amount of ore which we hope to be able to ship next year that 40s. per ton will pay all our expenses and the debenture interest, and it may possibly leave a surplus. If there be a large surplus it will leave a surplus, and that surplus will be devoted to the further development of the mine. When the sum of 30,000*l.* is paid all the remainder, deducting 30s. per ton freight, which is the minimum freight, to the Bolivar Railway Company—will go to the shareholders of this company, so that the fact of this working or the chance of this working being effective depends upon the amount and the quality of the ore which we shall be able to ship, and to this object the efforts of your directors and manager are constantly directed. We think under the agreement I have mentioned to you we can see our way, that if the produce maintains the quality it has done—to some kind of surplus next year? Of course, as the mine develops, and our arrangement remains something similar, that surplus will pay interest on all the debentures, and the deduction of 40s. per ton will have the effect of discharging our current payments, and make it unnecessary to ask for cash advances (which is a position we formerly occupied) as little as possible hereafter. (Hear, hear.) I have said all of the objects—the main object—of this arrangement was to enable us to ship different quantities of ore, which we think it desirable to ship, and that has been done, but I need not tell you that there are qualities of ore in the various parts of this mine which it would, really, be hardly worth while to ship. There are some inferior ores, and the question of the treatment of these inferior ores is one which is of great importance to the future of this company. Now, we are not in a position to make experiments and go into extensive operations of that kind; we have not the money to do it, and we do not mean to do it, but we are in a position to know what other people are doing, and if we find that the subject of the treatment of inferior ores is successfully solved—and there are many experiments going on—we hope to be able to profit by it, and apply what we consider to be the best plan for the treatment of these ores. We do not ask you to be at present, at any expense in the matter, but if we find a satisfactory plan discovered we may take advantage of it, and we may hope to have a large development in our returns from the treatment of these inferior ores. There is one thing you must remember, and it is of considerable importance—that what we call inferior ore here is reckoned to be good ore in other places. Owing to the distance and transport, they are not available to bring over in the crude state, but we believe that the treatment which will prove advantageous to ores of 2 or 3 per cent. of copper will prove still more advantageous with our inferior ores of 6 or 7 per cent. of copper, and we hope if it is successfully solved it may result in very considerable returns for this company. (Hear, hear.) I have said that many experiments are going on at the present moment by different parties, and there are many processes which more or less fulfil the objects required. I do not say that any one of them in particular fulfils what may possibly be produced hereafter. It is one of those scientific questions which often occur, to which a great many minds are applied, and which has got so far near completion, I think, that we may confidently hope before very long a real and practical solution may be arrived at. That solution we watch for, and we desire and intend to take advantage of it as soon as it has been sufficiently demonstrated to us that it has been accomplished. (Hear, hear.) There is another matter, which I have no official right to mention here, but is an interesting one, and it may be of great importance to us. We have, as you see, made an arrangement with the Bolivar Company, which is very much more favourable to us than the original arrangement with them; but I can only be able to state, on what I believe to be good authority—although, as I said, I have no official right to mention it—that the Bolivar Railway is opening up a very considerable trade independent of us, and although our arrangements with them are on a more favourable footing for us than at first still there is the prospect, and a good prospect, of a very con-

siderable development of that line from other sources. Now, I mention that because I think it is a matter which concerns us very materially in estimating our prospects, because if that company has a large trade, and be in a flourishing condition, I need not tell you that, in the first place, it will enable it to carry on the works with greater facility, and do everything more easily than now; and it will also have this effect, that if there is a large trade from other sources, in all probability the expenses will be proportionately diminished, and possibly, in the course of time, providing they advance into a very prosperous condition, we may get even more favourable terms than we have now, although as I have said I think these terms are very satisfactory for the present. (Hear, hear.) There is one result of our arrangement with them which I may mention. You will see in these accounts there is a considerable sum of expense incurred in America, and inasmuch as by the arrangement with the Bolivar Company they undertake the whole cost of shipment, and we simply hand them the ore at the mine, and we have nothing more to do with it except to send it down, we have found it possible to dispense with a certain number of officers at Tucacas. The gentlemen whose services were dispensed with had done their work very well, but as we found that the Bolivar Railway Company could undertake the duty it was no longer necessary for us to maintain that staff at Tucacas. The economy thus effected amounts to 1500*l.* per annum; it does not appear in these accounts, as the alteration was not made until the half-year closed, and the benefit will not altogether appear in the present accounts, because those gentlemen were entitled to some consideration upon leaving our service, but I hope in a year that economy will be realised, or some considerable portion of it. (Hear, hear.) I have explained the principle upon which we are conducting our affairs. I do not wish, as I have already said, to make any prophecy for the future; nothing is a greater mistake to anyone holding my position. What I wish to do is to put you in possession of all the facts of the case, and you can make your own estimate about it as well as I can, and probably much more satisfactorily. That is the object which the board of directors have had in view; first, to push on the investigations—which have been pushed on, and will be pushed on, and as far as they have gone they have been completely satisfactory. We have also arrived at the favourable agreement I have referred to with respect to the transport of the ore, and we have our hands free now to send all the ore which we think can possibly pay. We watch these scientific experiments which are in course of being made with respect to the treatment of these inferior ores, and if these experiments turn out satisfactory (as we have every reason to suppose they will), that undoubtedly will afford us a very considerable increase of our revenue. There is, of course, one thing against us; one thing in particular in which we are not at all singular, that is the present state of the copper trade. The present state of the copper trade is, I suppose, more depressed than it has ever been in the recollection of anyone engaged in this industry. I am afraid it is not the only trade in this condition. The price has certainly risen a little from the lowest point, at which it stood a few weeks ago, but it would be idle to say that at the present moment, there is any prospect of an immediate revival in that or, I am sorry to say, any other trade. I could mention when the copper trade returns to anything like the position it held in former years the effect upon us would be that not only should we get a large price for the ore, but we should be able to send to market a large amount of ore which at present it does not pay to send. We are labouring under that disadvantage. I hope it cannot get any worse. I do not see how it can pay any company or individual to work copper at the price at present paid for it. But it is idle to deny that we are in a very depressed condition, and all our calculations are to a certain extent restricted, and all the statements I have the honour to make with respect to the value of the mine are restricted by that peculiar state of affairs. I hope the change will come soon, and come for the better, but it would be fair to admit, and I am bound to mention it as one of the serious elements in estimating our present condition. (Hear, hear.) I have one melancholy duty to perform, which is to acquaint you with the death of one of our colleagues—Mr. Oakes—who has long been a director. He died rather suddenly two or three weeks ago, and I am sure we (his colleagues) all feel much regret at his loss. (Hear, hear.) I may mention that it is not the intention of the board to fill up the vacancy so created. Now, gentlemen, I have explained in a general way what is our present position and what is the policy upon which the board are acting. I shall be perfectly ready, and my colleagues also, to afford you any information which you gentlemen may wish to have further in detail with respect to the progress of the company. My desire has been to show you the policy we have pursued and the efforts we have made, and so far as we know, the result of those efforts. (Cheers.) Gentlemen, I beg to move that the report and accounts be received and adopted. Mr. T. W. MEATES seconded the resolution.

A SHAREHOLDER said no notice was taken in the report of any directors who retired at this meeting. He asked whether no directors retired?

The CHAIRMAN: That matter was under consideration, and the course we adopted was this. We found under the Articles of Association that a certain number of directors were to retire at the second meeting every year; but it so happened that a certain number retired at the last meeting, and the impression upon our mind was that the meaning of the Articles of Association was that they should retire at every second meeting, and accordingly, under that interpretation—I do not know that we are right—the directors who have been longest in office will retire at the next meeting.

A SHAREHOLDER: I understood that the directors' remuneration was limited to 500*l.*, although the number of directors was increased, until a payment was made out of the profits of the mine. I understood at the last meeting that such was the case.

Mr. N. LEABOYD: The gentleman has some mistaken recollection. The Articles provide that there should be as many hundreds of pounds as directors by way of remuneration to the directors. If there are five directors the remuneration is 500*l.*, if seven directors the remuneration is 700*l.*

The resolution for the adoption of the report and accounts was then put and carried.

Mr. N. LEABOYD then moved that the election to the board of the Hon. T. C. Bruce, M.P., Mr. George Lyall, and Mr. T. W. Meates be confirmed. It would be in the recollection of shareholders that at the last general meeting he stated that, inasmuch as the addition would be made to the board, and three gentlemen had been named were suggested to the directors by some of their influential friends and shareholders, and their appointment was made not only with the most perfect satisfaction on the part of the board, but with their unanimous concurrence, and not only with the concurrence of the board, but also the full approval of many important and influential shareholders whom the directors consulted on the subject. He thought the meeting would be satisfied, from the clear, concise, and business-like statement which had been made by the Chairman to-day, that the directors had not made a mistake in asking Mr. Bruce to accept the chairmanship of the company. (Cheers.) In Mr. Lyall and Mr. Meates also the gentlemen on the board, the Chairman would contribute by the reputation, and their business experience to strengthen the position of the company.

Mr. F. H. HEMMING seconded the resolution, which was put and carried.

Mr. D. D. LEWIS proposed a cordial vote of thanks to the Chairman for his able and lucid explanation.

A SHAREHOLDER seconded the resolution, which was put and carried, and the Chairman having acknowledged the compliment the meeting broke up.

### BOWING'S PATENT FILTER PRESS COMPANY.

The general meeting of shareholders was held at the offices of the company, Gresham House, on Friday, November 29.

Mr. THOMAS EYRE FOAKES, the Chairman, presiding.

Mr. J. JAMESON TRURAN (the secretary) read the notice calling the meeting.

The CHAIRMAN, who addressed the meeting at considerable length, fully explained the position of the patents at the time they were purchased by the company, and the great improvement which had been made in the construction of the presses since that time, and which had resulted in a new patent granted so recently as September last. In order to explain this he drew attention to the drawings of the old and new presses, which had been sent to the shareholders with the directors' report. He then proceeded to explain and comment upon the various contracts the company had entered since the commencement of business, and he especially referred to the contractors' delays in the erection of the press at Messrs. White's works at Swancombe as having been the cause of much damage to the company, not only at Messrs. White's, but at the works of the other parties with whom contracts had been made. He then explained that Messrs. White had been so satisfied as to the capability of the press to dry their slurry that they had sent for Mr. Bowing, and arranged with him for the erection of another press, and that will be proceeded with as soon as possible. He particularly referred to the experimental press which the company had erected at Messrs. Meaken's works at Stoke, pointing out that although at the trial it was shown that certain small structural defects required to be remedied in the end it resulted in an immediate order being sent for four presses from that district. He added that the defects above referred to were being remedied, and that the presses would be disposed of in about a fortnight. That the press would then be again sent to Stoke for trial, and that there could be no reasonable doubt as to its complete success. Quoting from what the company's proposed agent at Stoke had said as to the demand for presses for the cottoneries in the neighbourhood of Stoke, he said it was estimated that something like 200 presses were sold in every year in that district alone. He then referred to what had been done by way of experiment with the press at Messrs. Boulanger's works, near Paris, and to the terms on which that gentleman had offered to introduce the press into France for pottery purposes. He also explained what had been done for the purpose of the drainage of the whole of the whole house cesspools in Paris, and the large field for profit open to the company in that material. The next matter referred to was the sewage question, on which subject a description was given of the experiments that have been carried on at Canning Town with the sewage of that district. He stated that an efficient press on the new principle was being fitted up there, and he pointed out that as soon as it was in operation, the company would have a convenient place in which to show their system of dealing with sewage. After referring to the utility which the press possessed for dealing with mine water and the wash from distilleries, and various other matters, explanations were given as to what had been done with the press at Messrs. White's, and the correctness of the reference to the press which had been taken place between the company and the Schiedam distillers relative to the wash referred to in the correspondence annexed to the report, his remarks showing the very large profit which would accrue to the company from dealing with this material. Referring to the foreign patents, the Chairman said that the directors had secured patents for the colonies and for 40 different foreign countries, and their object would be to sell as many of these as possible, and from this source alone they hoped to more than recoup the company their entire capital. As regarded the patents for the United States and Canada, they had been sold to Mr. Howell for the sum of 5000*l.*, of which 3000*l.* was paid in cash, and Mr. Howell gave his acceptance for the remainder, one-half payable on Feb. 4 last, and the other half on May 4 last. These acceptances were not met at maturity, and they had not since been paid. As regarded the continental patents, none of these had been disposed of, and as these were certain to turn out extremely valuable, the directors would proceed with great care in dealing with them. Agencies had been appointed in several European States on a liberal commission, but up to the present time, of course, but little had been done, but this arose to some extent from the fact that until the latter end of September last the directors had not succeeded in securing patents for the new form of press in those foreign states where they were such protection to the press. Referring to the press to the press, which the directors had proceeded in introducing the press, he said that as they had supplied the press and necessary machinery at the company's own expense, it had, of course, entailed a large outlay of capital on the part of the company,



and the reason why the shareholders capital was only now on the point of becoming productive was that very much time and labour had been expended in remedying the defects of the old press and in maturing the new one. Every effort had been made to keep down the expenses; the directors at present were giving their services without remuneration, and with these and other economies the directors believed that if a small amount of money could be borrowed on a mortgage, the company's English capital would be unnecessary to raise any fresh capital. As to the German patent, there was still the probability of its being sold, and the purchase-money of this would suffice not only to pay off the proposed mortgage, but to provide the company with a good working capital. The directors were very happy to inform the shareholders that the Commissioners of the Paris Exhibition had awarded a bronze medal to the company for the press they had exhibited. In conclusion he (the Chairman) moved the adoption of the report and accounts.

Mr. Kent seconded the resolution. A very long, and occasionally personal, discussion ensued, and some of the shareholders complained that the directors had not shown sufficient energy and discretion in the mode they had adopted for pushing on the completion and introduction of the machines. In reply, the CHAIRMAN ably defended the action of the board; he pointed out that many improvements had to be made in the press after its acquisition by the company, and contended that, under all circumstances, the directors had done the best they possibly could for the shareholders.

The adjourned meeting was held on Dec. 5, when Mr. BOWING, the patentee, and who has also had the management of the construction of the presses, replied to the observations which had been made regarding himself at the previous meeting and also explained generally the reason why greater progress had not been made. It is not necessary to go at length into Mr. Bowing's explanations, many of which referred to details, and others to personal matters. In the discussion which ensued a general impression seemed to exist that the company really possessed a most valuable process, and that the great point to be aimed at was to complete one or two machines and get them successfully to work, and thus demonstrate to the public the thorough success of the invention. In reply to a question, Mr. BOWING said he hoped in a very few weeks to get the Stoke press thoroughly finished and in working order.

In the end the following resolution was passed:—"That this be adjourned for three months from Dec. 5, the board in the meantime to confine their attention to the completion of the Stoke and Hull presses; but if those presses, or either of them, be completed at any date previous to the expiration of the three months, the board shall summon the adjourned meeting of shareholders forthwith." A vote of thanks was then passed to the Chairman, and the meeting adjourned.

#### THE GLYN LEAD MINING COMPANY.

At an extraordinary general meeting of shareholders, held on Friday, Dec. 6, at the registered offices of the company, Coleman-street Buildings, the resolutions passed on Nov. 20 were confirmed. These resolutions authorised the creation of 24,000 new ordinary shares of 1l. each, considered as fully paid, to permit the completion of contracts with W. Sturge, E. T. Sturge, A. J. Norris, L. Lewis, W. Francis, and P. Jones, who share to rank with the 11,000 original ordinary shares as to voting, dividends, and winding up. Further, 17,500 10 per cent. preference shares of 1l. each are to be created—deficiency of one year to be made good out of profits of subsequent years, and in the event of winding up with surplus assets such preference shares to be repaid in full before ordinary shares come in. The directors are authorised to issue the preference shares in any manner they may think fit. The name of the company is to be the United Van Consols and Glyn Lead and Barytes Mining Company.

The following report as to the mine was read by the secretary to the meeting, which considered it highly satisfactory:—

Van Consols and Glyn Mines, Dec. 4.—As requested I have very carefully taken the various bearings of the outcrop of the Van Consols lode, from the river or western boundary of the site to the eastern boundary of the Glyn Mine grant. Thence through Penryn's act into the Van Mine, the average bearing of the lode would traverse the bottom some 50 yds. south of the engine, halfton 90 fms. and upwards, from the outcrop of the lode in that property. I have also taken the bearings and distances from the entrance of the Van Consols adit north to the north lode, and find them to be 8 fms. asunder. This lode underlies south, and apparently at the same angle as that of the Van Consols lode, and which, no doubt, will run parallel with it throughout the property. I may add here that a level has been driven some 7 fms. east on its course from the margin of the river, therefore it is not under much cover yet; nevertheless, it is well defined, and consists of matrices essential to the production of lead. If driven on into the hill, the altitude of which I have ascertained, it would soon be under a cover of 96 fms. when in all probability large quantities of lead will be found. There is a well-defined cross-course intersecting the lodes in the western part of the property, and against which, east and west of it, Van Consols lode produced thousands of tons of lead. On the cross-course alluded to some years ago a level was driven north to the adit level 46 fms. from the Van Consols lode towards the north lode, with a view of testing its character and value. For want of funds that object was never attained. There still remains some 45 fms. to drive. The ground is easy for excavation, and requires but little if any timber to support it; therefore, the remainder of drainage would be effected for 4l. per fathom. I think that would be the maximum price. This matter is well worthy of attention. From the direction indicated by compassing the north lode is in a line with the lead-producing vein in the Great Van Mine, which is still abundantly rich.—JAMES ROACH.

Mr. THOMAS (the Chairman) made some valuable explanatory remarks upon this report, and thoroughly endorsed the opinion stated in it, and expressed his confidence in the future of the united company. A cordial vote of thanks to the Chairman was passed.

#### EMMA SILVER MINING COMPANY.

The annual general meeting of shareholders was held at the City Terminus Hotel, on Tuesday.—Mr. MACDOUGALL in the chair.

The report, stated that the claim against Messrs. Bischoff, Bompas, and Bischoff, the original solicitors of the company, for the sum of 2000l., received by them from Mr. Albert Grant, had been amicably settled by those gentlemen expressing their willingness to refer the matter to the arbitration of Mr. Day, Q.C., in accordance with whose award they had paid to the company the sum of 2000l. The claim against Messrs. C. F. Kemp, Ford, and Co. for moneys received by them in connection with the promotion of the company had been settled by the payment by them to the company of the sum of 1800l. The claim against Mr. George Anderson for the return of his qualification shares was contested by him up to the actual day of hearing of the case, when, without offering any defence, he submitted to judgment being signed against him for the full amount claimed and costs—2490l. 18s. 10d. The directors thought it was a matter for observation that the company was thus exposed to every possible expense and trouble, for upon application being made for payment of this judgment debt, Mr. Anderson called a meeting of his creditors, at which he submitted a statement of his affairs, according to which there were, practically speaking, no assets. With respect to the proceedings in the English Chancery Courts against the vendors and promoters for a rescission of the contract, breach of trust, and the return of moneys taken by the company, the directors, with the knowledge of the company, the directors reported that the American defendants, Park, Baxter, Stewart, Schenck, Lincoln, and the Emma Company of New York (the vendors), had not appear to the action, although they had been duly served, and though the company was entitled to ask for judgment by default against them, such judgment would be of no practical avail so long as these defendants kept themselves beyond the jurisdiction of the English Courts; consequently, (Mr. Puleston having settled the company's claims) the proceedings in Chancery were practically confined to the claims against Albert Grant, Maurice Grant, and George Anderson. In these circumstances the directors thought it best (with the approval of counsel), upon Mr. Albert Grant's applying for a commission to take evidence in America (which would have involved great delay and exposed the company to very great expense), to apply to the Master of the Rolls for permission to confine the issues to be tried, so far as the defendants Albert and Maurice Grant were concerned, to the questions, "Were they promoters?" and "For what profits are they responsible to the company?" This application was strongly opposed by these two defendants, but the directors having undertaken to abide by the result of the trial of these two issues so far as these two defendants were concerned, the Master of the Rolls ordered that the case should be put down for trial at once upon these two issues. The amount claimed by the company from the defendants Albert and Maurice Grant under these two issues is (including interest) about 200,000l. With respect to the proceedings in the American Courts, they comprised an appeal from the verdict of the jury in the Common Law action presided over by Judge Wallace and a Chancery suit for rescission and breach of trust against the vendors—the Emma Company, of New York—and Park, Baxter, Stewart, Schenck, &c. They were satisfied with the progress of this suit.

The CHAIRMAN, in moving the adoption of the report, said they had nothing to report upon mining matters, and with regard to legal matters they were for the most part satisfied. As regarded the reports and accounts of the Gardner board, they recommended that they should not be adopted until certain matters were investigated by the shareholders. With regard to their action against Messrs. Lewis and Son, the metal-brokers, referred to in the prospectus, it was on two grounds, the ground of conspiracy—that they conspired with Grant and Park to foist this mine on the British public, and in support of this ground they produced such evidence that the jury could not agree. The other part of their claim was that Messrs. Lewis and Son, as promoters of the company, received about 6000l., which with interest had since amounted to 8000l., and the jury found a verdict for the company on this ground, and at the end of the trial in June last Mr. Justice Denman would not enter judgment on the verdict of the jury until he had heard the arguments of counsel. He did not hear these arguments until Nov. 27, and as they were taken on Saturdays, they expected to have six more Saturdays' arguments.—Mr. ROMANES (a director) seconded the adoption of the report, and the motion was carried unanimously.—The directors were then re-elected, and in reply the CHAIRMAN said when they took office they had no mine, no ore, no tools, and only a shilling or two. They were a little better off now than when they started, and he thought they were not far from the end of their labours.—Mr. John Young, of Messrs. Turquand, Youngs, and Co., was re-elected auditor, and the proceedings then terminated.

GREAT SNAREFELL MINING COMPANY.—The annual general meeting of shareholders was held in St. James's Hall, Douglas, on Wednesday, Nov. 27, Mr. H. B. Noble (chairman of directors) presiding. The accounts showed that the receipts had been 1462l. 19s. 7d. The labour cost of the year amounted to 822l. 14s., and merchants' bills to 515l. 13s. 11d. The balance brought down was 113l. 3s. 3d. The liabilities of the company amounted to 298l. 8s. 3d., and the assets to 274l. 5s. The secretary read the reports of the directors, manager, and auditor. The directors state that the dressing machinery has been set up, and is ready to commence working at any time, but

taking into consideration the low price of lead and blende ores it is not thought prudent at present to dress the ore stuff at surface.

#### ST. JOHN DEL REY MINING COMPANY.

The half-yearly general meeting of shareholders will be held at the Cannon-street Hotel, on Wednesday, when the report of the directors, of which the subjoined is an extract, will be submitted.

During the half-year the general work at Morro Velho has been carried on steadily, and great efforts have been made to bring the machinery into the most efficient state. The gold obtained from April 9 to Oct. 8, both days inclusive, was 207,496 ozt., or 23,921 ozt. Troy. The produce for the corresponding period of last year was 238,136 ozt., or 27,453 ozt. Troy. An unusually long dry season has seriously impeded the stamping power. The rainfall for the year ending Sept. 30 was only 44.61 in., against 79.32 in. in the preceding 12 months. The net profit on the working of the mine for the half-year has been 38,169l. 6s. 4d.; in contrast with the half-year, 400l. 9s. 3d.; amount of net profit brought forward from last year, 5027l. 13s.; total, 43,697l. 8s. 7d. From which deduct London expenses for six months, 1194l. 18s. 6d., and there remains available for dividend 42,503l. 10s. 1d., out of which the directors have the satisfaction of recommending a dividend of 15 per cent. on the capital of the company for the half-year, free of income tax, which, with 10 per cent. thereon to the reserved fund, will absorb 41,745l., and leave to be carried forward 857l. 10s. 1d.

The sump shaft has been sunk vertically during the half-year 5 fms. 2 ft. 10 in.; during the preceding half-year, 5 fms. 4 ft. 5 in.; during the corresponding period of 1877, 3 fms. 4 ft. 10 in. The two eastern levels were extended during the first three months of the half-year—level over sump 2 fms. 6 in.; level under roof, 1 fm. 3 ft. 8 in.; and the western level was extended during the same period 2 fms. 1 ft. 9 in. The development of the lode in the western section of the mine has been continued steadily during the half-year with satisfactory results. Although the mineral raised from the mine during the half-year has been stamped, and none rejected and thrown on the refuse heap, still it has been necessary for the proper working of the mine to quarry a considerable quantity of kyllas and other inferior mineral; 3911 tons of this and other mineral were stamped at the Praia stamps, and yielded 4,659 ozt., or 537 ozt. Troy per ton. The remainder was stamped with the general mineral at the Morro Velho stamps, and tended proportionately to lower the yield of the mineral so stamped.

The quantity of gold recovered from 31,768 tons of minerals stamped at the Morro Velho stamps during the six months ending Sept. 30 was 159,442 ozt., or 21,739,580 ozt. Troy, giving an average standard or yield of 5.962 ozt., or 6871 ozt. Troy per ton. Of the above 31,768 tons stamped, 24,174 tons were of mixed mineral, stamped at the general stamps, and produced 5,581 ozt., or 643 ozt. Troy per ton, and 7394 tons were mineral freed from kyllas stamped separately, and produced 7,177 ozt., or 828 ozt. Troy per ton. Taking the difference occasioned by the mineral being now actually weighed and taken at its actual weight. Instead of, as formerly, by computation, it is shown that the standard of the general body of the mineral formation is as high, if not higher, than that at any former period.

The average loss of gold in treatment, ascertained by two different modes, and by assays made both at Morro Velho and in London, and the mean of the results, shows a loss of about 2.7 oztavos, or 3111 ozt. Troy per ton, which, considering that the four sets of figures do not vary very considerably, may be taken as fairly approximating the actual loss. This loss is still large, though slightly less than the last year's report showed. Considerable improvements have been made in the straking floors, and other arrangements are in course of being adopted, which the directors hope will lead to more satisfactory results during the current half-year.

Early in the year the directors gave instructions for a careful survey being made of the water-courses with a view to see whether by improvements in their construction, by carefully taking up all tributary streams, by stopping leaks, by improving the application of the power, by reducing the friction of the wheels, and by greater economy being exercised in the use of water for objects other than driving machinery, a sufficient increase of power might not be obtained from the existing water-courses without going to large expense in obtaining additional power from other sources. The matter was taken in hand by Mr. Oldham, the company's engineer, under the superintendent's direction, and the result has been most satisfactory. Mr. Oldham reports that the water supply can, at a very moderate expense, be so improved as to give sufficient power to drive all the necessary machinery at full speed, even in the dry season. The necessary works for accomplishing this desirable object were commenced in August, and will, it is hoped, be finished by the commencement of the next dry season.

The surface operations at the Cuiba Mine have been confined to work necessary for accommodating the mechanics and labourers, for providing water power, and for erecting a stamping mill, to be ready for stamping the mineral when it can be brought to the surface in sufficient quantity. In the mine the levels opened by the former proprietor have been repaired and extended until the lode has been reached, and driven into in two opposite directions. At one point it has been crossed for a distance of 35 ft. without reaching the head-wall. These levels are being carried along the course of the lode in each direction. Cross cuts will now be made from them to ascertain the width of the lode, and a sufficient quantity of the lode from wall to wall extracted to fairly test its auriferous quality. The directors hope 1000 tons will be stamped before the annual meeting; they consider the average value of the lode for practical working purposes can only be ascertained by adopting this course.

The financial statement shows the securities in which the 54,600l. 11s. 7d. reserve fund is invested, and that after payment of dividend, &c., there is about 2600l. cash balance.

#### FOREIGN MINING AND METALLURGY.

The Belgian coal trade has not exhibited much change, although it may be observed that working operations have been a good deal interrupted by the fêtes of Saint Barbe and Saint Eloi. There is still a good current of deliveries, principally by railway, navigations being impeded by persistent floods. As the movement of sugar beet has been provided for for the season, there have not been many complaints this year on the part of colliery proprietors as to an inadequate supply of rolling stock on the Belgian State Railways. Prices have been generally firmly maintained without variation; stocks are being reduced, and if the demand continues a slight advance in quotations appears possible, and even probable. In the Lige basin the condition of the collieries is also considered to have improved. Stocks have been reduced, and several collieries cannot provide for the demand which they have to meet; some descriptions of coal are accordingly advancing. The imports of coal into Belgium in the first ten months of this year were 567,215 tons, against 529,504 tons in the corresponding period of 1877; the imports of coke were 17,798 tons, against 18,709 tons. The exports from Belgium in the first ten months of this year were 3,097,385 tons, against 2,815,225 tons; the exports of coke were 470,619 tons, against 481,317 tons.

The Belgian iron trade remains quiet and stagnant. At the last meeting of the industrial bourse of Brussels the principal subject discussed was the approaching adjudication of trucks for the Belgian State Railways. The Thy-le-Chateau works are said to be carrying out some improvements in the manufacture of steel. The imports of minerals and lemmelles into Belgium in the first ten months of this year are officially returned at 705,713 tons in the first ten months of 1878, as compared with 633,832 tons in the corresponding period of 1877. The imports of rough pig and old iron into Belgium in the first ten months of this year increased to 173,974 tons, as compared with 155,729 tons in the corresponding period of 1877. Of steel the imports into Belgium in the first ten months of this year were 4260 tons, as compared with 3889 tons in the corresponding period of 1877. The exports of steel from Belgium increased in the first ten months of this year to 17,644 tons, against 9395 tons in the corresponding period of 1877. The exports of minerals and lemmelles from Belgium to October 31 this year amounted to 208,958 tons, against 176,008 tons; of rough pig and old iron, to 3949 tons, against 9915 tons; of iron rails, to 28,120 tons, against 33,852 tons; of plates, to 19,952 tons, against 14,022 tons; and of other descriptions of iron, to 107,946 tons, against 88,264 tons.

A committee of colliery proprietors in the French departments of the Nord and the Pas-de-Calais, has been discussing the insufficiency of plant on the Northern of France Railway. In some pits, it appears, it has become necessary to suspend working operations in consequence of an inadequate supply of wagons. The Commission of Public Works in the Pas-de-Calais has appointed a delega-

tion to study ministerial projects prepared with reference to new canals and railways, as well as the question of a great canal from the North of France to Paris, upon which the Government appears to have virtually decided. On the other hand, M. Flament, ordinary engineer of the first class, has been specially charged by the Government with the duty of making surveys for the canal. M. Flament will reside for some time at Amiens, for the purpose of conveniently devoting himself to his new duties.

In the French department of the Haute-Marne the works are now receiving order, which maintain them for the most part in activity. Iron from coke-made pig has not yet fallen below 6l. 8s. per ton for first-class, but it is not selling at all freely. In the Nord the orders received on provincial account are a little more liberal than they were at the commencement of the month, but great difficulty is, nevertheless, experienced in effecting sales. In the Meurthe-et-Moselle pig remains without much change; the quotation at Nancy is 2l. 5s. per ton, and at Longwy 2l. 2s. 6d. per ton. The basin of the Loire and Rhone still presents some animation, but it is of no great importance. It is announced that MM. Duront Freres, of Louvroil, near Manbengo, have just paid off 90 of their workpeople; the men will probably have considerable difficulty in finding employment under present circumstances. Depression prevails in Germany as well as in France. A meeting of the Darmstadt Foundries and Construction Workshops Company is about to be held to determine the important question whether the company's works shall be continued in operation. A forced realisation or liquidation of the concern would probably be attended with disastrous results.

A letter from Chemnitz says that an order for 18 locomotives, in addition to other commissions sufficient to keep the works going for several months to come, has been received in the Saxon Machine Factory (Hartmann's). Considerable orders have also been received in Zimmermann's Implement Factory in the same town.

#### THE WILD DUCK, OR SPORTSMAN'S ARMS.

"Well comrades," says Uncle Henny, "one more mitten will bring round Christmas again; and how fast time do fly away, don't it?" "Is, a do," says old Tom, "and some people will tell ee that time after a man is 20 year old run away twice so fast as a ded before 20." "I thought," says Jan Temby, "we should have something new this mitten; and 'tes something new sure enuff to know that time is longer before a man is 20 than after. Es that the only new thing, old Tom, thees found out since last Christmas?" "Why no, Jan," says old Tom, "I've found out more than that a good deal." "Come then," says Jan, "out wed en for the good of the company." "Well, then, a cheap workman is the dearest; and the able and willing workman will never have fair play 'till he get a fair price in sight, and so much as a can do for the month. When this done adventures and workmen will be gainers, for so much work will be done then in one month as is done now in two months. All the people in all the bals should be paid by 12 o'clock on Saturday, and all first core men and surface people should work till 12 o'clock on Saturday; six hours es long enuff for them to do their marketing and have a little pint, and right their accounts, and every man that wor not in his place working on Monday morning should be turned right out of the bal. I don't know there is much new in machinery." "What's the boring machine," says Jan. "The boring machine, Jan, was invented by Capt. Trevithick before you wor born, an if es coming into use it es no new thing. Capt. Trevithick's invention of the round boiler saved millions of money in Cornish bals, and if his boring machine was used from the time he invented it millions more would be saved, but his boilers benefited all the world, and I never heerd that so much as a moorstone poss wor put to stand upright to his memory. Monuments are so thick as blackberries for them that made fortins out of our bals and other things, but he gave us millions, or his inventions ded, which 'tes all the same, is never mentioned with the big scientific and wise men of the institutions in the district where Trevithick wor born no more than if such a man never existed. I tell ee, men, the there institutions and classes and fine speeches look very fifty in the newspapers, but to my mind the should do some good fast—ivent some useful thing, and make the grand speeches afterwards." "I don't know," says Jemmy Dowd, "what good the there institutions will do, but I do believe that good sometimes come out of evil. The boring machine is a good thing, but I don't think a would be used so soon, or 'prap's not at all, but for the low price of tin; the low price is making people open their eyes to find the way to make two ends mit. Who will say—I'm sure you can't, old Tom—but the there institutions you say have done no good will not yet produce another Columbus, or another Bolton and Watt, or another Sir Humphry Davy. There's a good fish in the sea as ever come out of it, and you don't know, old Tom, but bigger and brighter men than the great ones I've named are hatching in the eggs of the institutions, and so soon as the bust the shells and like young chicks able to crow, look out my boy, for then you will find inventions discovered to work our bals, and make profits with tin at 20l. a ton. Then, old Tom, you and everybody else will be saying, whatever would become of we and all the rest only for the institutions." "If you believe this, Jemmy," says old Tom, "we must allow that the drop in the price of tin will do more good than harm." "I believe it," says Jemmy, "and not the drop in tin only, but in all other minerals, for we working miners know very well that necessity will make men think more and work harder, improvements will be made in all directions, twice as much ground will be spent for the same money, engineers will make the engines do twice the present duty, dressers will save all the tin, and the copper and lead now left to run away, and other valuable things saved that the now throw over the dead burrows. All the there things will be done, old Tom, and scores of things besides; your dry dressing among the rest, and then everybody will be saying what a pack of fools we wor to be frightened with fearin' tin and copper. If every man will do his best we can and will beat the world, as we often ded before." "Tes all right enuff what you are saying, Jemmy," says Jan Jewell, "but what will become of all the bals while the things you are telling about, or before we get the benefit of all the there inventions and discoveries." "I'll tell ee, Jan, you know so well as I do that it es a sin to rise so much tin to pay dividends, and that the bals now strugglin' to make profit ought to put that there money in boring machines, skiproads, and every other improvement, and while the there things wor doing only rise barely enuff stuff to mit cost; but when all the new improvements are in coase, why then cut away like heroes, as dividends would be paid with a lot less cost, and the rising of a lot less stuff for you see after all that the stopping the dividends (to do the there things) for a short time would be exactly like lodging money in bank at 25 per cent. interest." "I think," says Uncle Henny, "that as tin will be sure to be rose at a less cost than now, a good many wise men and managing men might not be far wrong to take Jemmy Dowd's advice—that is, save everything, make every improvement that can be made, and stick to un', and keep on improving, and we needn't care a pin for furrin tin and copper; and I hope, comrades, we shall all be spared to meet again to have a comfortable Christmas cup, and a few good 'kerls."—From Cousin Jack's Unpublished MSS.

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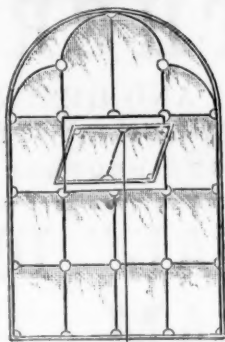
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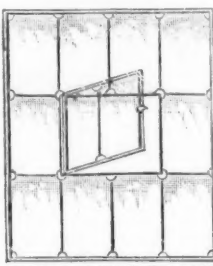


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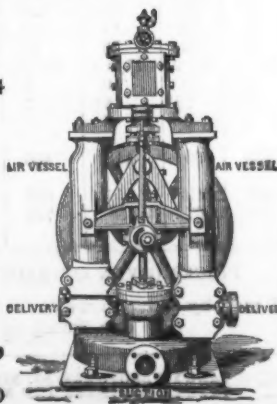
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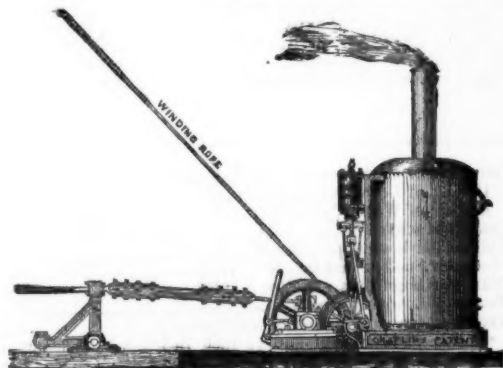
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meter up to 12 feet, made by Scott's Patent Moulding Machine, without the  
aid of patterns, and with an accuracy unattainable by any other means.  
MACHINERY or FOREIGN MINES carefully prepared.  
SECONDHAND MINING MACHINERY, in good condition, always on sale,  
at moderate prices.

Prize Medal—International Exhibition, 1862.



### CHAPLIN'S PATENT PORTABLE STEAM ENGINES

FOR PUMPING AND WINDING.  
SPECIALLY ADAPTED FOR PITS, QUARRIES, &c.

SIMPLE AND STRONG; require NO FOUNDATION  
OR CHIMNEY STALK, and are  
EASILY ERECTED OR REMOVED.

Sizes, from 2 to 30-horse power.

Steam Cranes, 1½ to 20 tons, for railways, wharves,  
&c.; hoist, lower, and turn round in either direction  
by steam.

Stationary Engines, 1 to 30-horse power, with  
without gearing.

Hoisting Engines, 2 to 30-horse power, with  
or without jib.

Contractors' Locomotives, 6 to 27-horse power.

Traction Engines, 6 to 27-horse power.

Ships' Engines, for winding, cooking, and distilling  
passed by H.M. Government for half water.

Steam Winches. Engines and Boilers for  
light screw and paddle steamers.

WIMSHURST, HOLLICK, & CO.,  
ENGINEERS.

CITY OFFICES: 2, WALBROOK, LONDON, E.C.  
WORKS: REGENT'S CANAL DOCK, 602, COMMERCIAL ROAD EAST,  
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THE DAILY CHRONICLE AND NORTHERN COUNTIES ADVERTISER  
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## PARIS EXHIBITION, 1878.



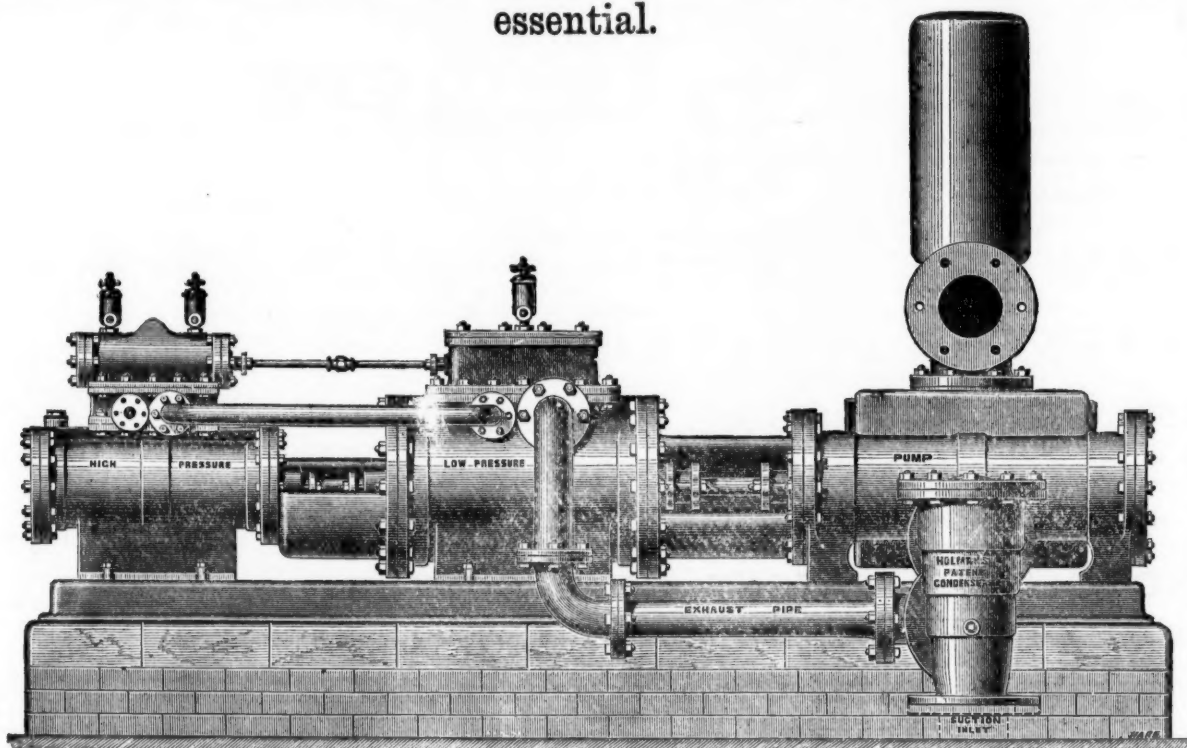
GOLD AND SILVER MEDALS AWARDED for  
Steam-Engines & Boilers, also the Special Steam Pump,  
with Holman's Condenser & Compound Pumping Engine.

## TANGYE BROTHERS AND HOLMAN,

HYDRAULIC AND GENERAL ENGINEERS,  
CORNWALL HOUSE, 35 QUEEN VICTORIA STREET, LONDON, E.C.,  
AND BIRMINGHAM, (TANGYE BROTHERS), CORNWALL WORKS, SOHO.

## THE "SPECIAL" DIRECT-ACTING COMPOUND STEAM PUMPING ENGINE

For use in Mines, Water Works, Sewage Works, and all purposes where Economy of Fuel is essential.



After several years of successful application for all purposes to which steam-driven pumps can be applied, THE "SPECIAL" STEAM PUMP STILL MAINTAINS THE FIRST POSITION IN THE MARKET, notwithstanding that it alone—of all direct-acting pumps—has been subjected to the great variety of severe tests that must be encountered in such a period of time. Some valuable improvements have been suggested in the course of a long experience, and their adoption has rendered the apparatus at once

### THE SIMPLEST AND MOST CERTAIN IN ACTION.

The illustration shows an extension of the principle of this Pump to a Compound Steam Pumping Engine, by which the economical advantages resulting from the expansion and condensation of steam are very simply and effectively obtained. The steam after leaving the high-pressure cylinder is received into and expanded in the low-pressure cylinder, and is thus used twice over before being exhausted into the condenser or atmosphere. The Engine combines simplicity, certainty of action, great compactness, fewness of parts, and consequent reduction in wear and tear.

Several thousands of the "Special" Steam Pumping Engines, with high-pressure cylinders only, are in use in British and Foreign Mines, Water Works, &c.,—and for confined situations, or where Engines of a comparatively small size only are necessary, they will still meet all requirements—but their application will be very largely increased, since it has been found practicable to embrace the important features of expanding and condensing the steam, so that increased power may be obtained, and the consumption of fuel greatly economised.

THE "SPECIAL" DIRECT-ACTING COMPOUND STEAM PUMPING ENGINE is the most simple appliance for deep mine draining and general purposes of pumping ever practically developed, and the first cost is very moderate compared with the method of raising water from great depths by a series of 40 to 50 fathom lifts. No costly engine-houses or massive foundations, no repetition of plunger lifts, ponderous connecting rods, or complication of pit-work are required, while they allow a clear shaft for hauling purposes.

### SIZES AND PARTICULARS.

Diameter of High-pressure Cylinder.....In.	8	8	8	10	10	10	10	12	12	12	12	14	14	14	14
Ditto of Low-pressure Cylinder.....In.	14	14	14	18	18	18	18	21	21	21	21	24	24	24	24
Ditto of Water Cylinder.....In.	4	5	6	5	6	7	8	6	7	8	10	7	8	10	12
Length of stroke.....In.	24	24	24	24	24	24	24	24	24	24	24	36	36	36	36
Gallons per hour approximate.....	3900	6100	8800	6100	8800	12,000	15,650	8,800	12,000	15,650	24,450	12,000	15,650	24,450	35,225
Diameter Suction and Delivery.....In.	3	3½	4	3½	4	5	6	4	5	6	8	5	6	8	9
Diameter High-pressure Steam Inlet.....In.	1½	1½	1½	1½	1½	1½	1½	2½	2½	2½	2½	2½	2½	2½	2½
Diameter Low-pressure Steam Exhaust.....In.	1½	1½	1½	1½	1½	1½	1½	2½	2½	2½	2½	2½	2½	2½	2½
Height in feet water can be raised with 40 lbs. pressure per square inch in } Non-condensing...	360	330	160	360	250	184	140	360	264	202	130	360	275	175	122
Ditto ditto ditto—with Holman's Condenser...	480	307	213	480	333	245	187	480	352	269	173	480	367	234	162
Ditto ditto ditto—with Air-pump Condenser...	600	384	267	600	417	306	335	600	440	337	216	600	459	203	203

### CONTINUED.

Diameter of High-pressure Cylinder.....In.	16	16	16	16	18	18	18	18	21	21	21	24	24	24	30
Ditto of Low-pressure Cylinder.....In.	28	28	28	28	32	32	32	32	36	36	36	42	42	42	52
Ditto of Water Cylinder.....In.	8	10	12	14	8	10	12	14	10	12	14	10	12	14	14
Length of stroke.....In.	36	36	36	36	48	48	48	48	48	48	48	48	48	48	48
Gallons per hour approximate.....	15,650	24,450	35,225	47,950	13,650	24,450	35,225	47,950	24,450	35,225	47,950	24,450	35,225	47,950	61,000
Diameter Suction and Delivery.....In.	6	8	9	10	6	8	9	10	8	9	10	8	9	10	10
Diameter High-pressure Steam Inlet.....In.	2½	2½	2½	2½	3	3	3	3	3½	3½	3½	4	4	4	5
Diameter Low-pressure Steam Exhaust.....In.	3	2	3	3	3½	3½	3½	3½	4	4	4	5	5	5	6½
Height in feet water can be raised with 40 lbs. pressure per square inch in } Non-condensing...	360	230	160	118	456	292	202	149	397	276	202	518	360	264	562
Ditto ditto ditto—with Holman's Condenser...	480	307	213	154	603	389	269	198	528	363	269	691	480	352	750
Ditto ditto ditto—with Air-pump Condenser...	600	384	267	191	750	486	337	248	660	450	337	864	600	440	937

### PRICES GIVEN ON RECEIPT OF REQUIREMENTS.

Any number of these Engines can be placed side by side, to work in conjunction or separately as desired, thereby multiplying the work of one Pump to any extent.

NORTH OF ENGLAND HOUSE  
SOUTH WALES HOUSE...

TANGYE BROTHERS, ST. NICHOLAS BUILDINGS, NEWCASTLE-ON-TYNE.  
TANGYE BROTHERS AND STEEL, Tradeagar Place, NEWPORT, Mon.; and Exchange Buildings, SWANSEA.



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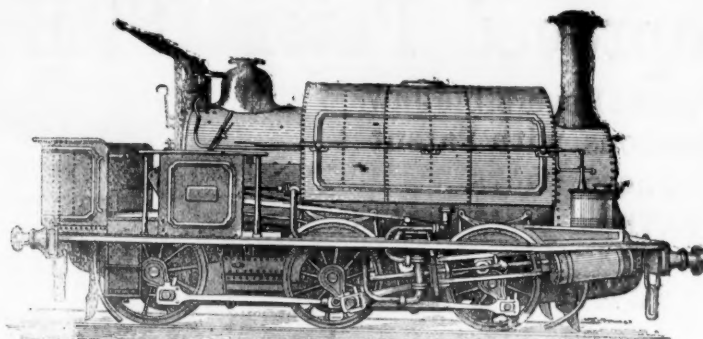
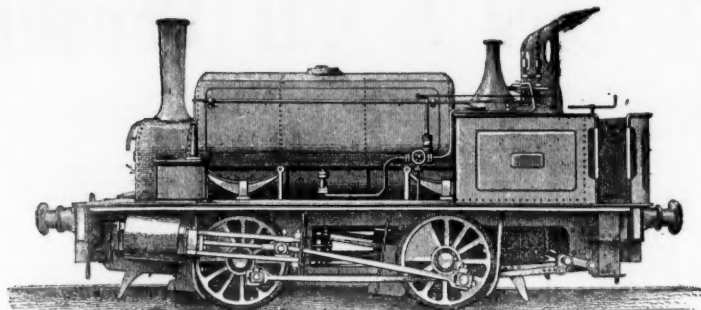
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ARE NOW MAKING A GREATLY IMPROVED  
CLASS OF

### TANK LOCOMOTIVE,

EITHER ON FOUR WHEELS OR SIX, OF  
VARIOUS GAUGES,

IN WHICH EXTRA STRENGTH AND DURABILITY ARE COMBINED WITH SIMPLICITY AND ECONOMY IN REPAIRS.



FIRE BOXES—Copper. TUBES—Brass. TYRES—Steel. AXLES—Steel. BOILER PLATES AND MACHINERY of the best Yorkshire Iron. NEW LOCOMOTIVES, with Cylinders 8 in., 10 in., and 13 in. diameter, always in stock or in progress. SECOND-HAND LOCOMOTIVES, of various sizes FOR SALE OR HIRE.

PRICES AND SPECIFICATIONS ON APPLICATION.

Awarded Gold Medal, Paris Exhibition, 1878,

AND THE PRIZE MEDALS AT LEEDS, MANCHESTER, AND WREXHAM EXHIBITIONS, 1875 AND 1876.

## HADFIELD'S STEEL FOUNDRY COMPANY,

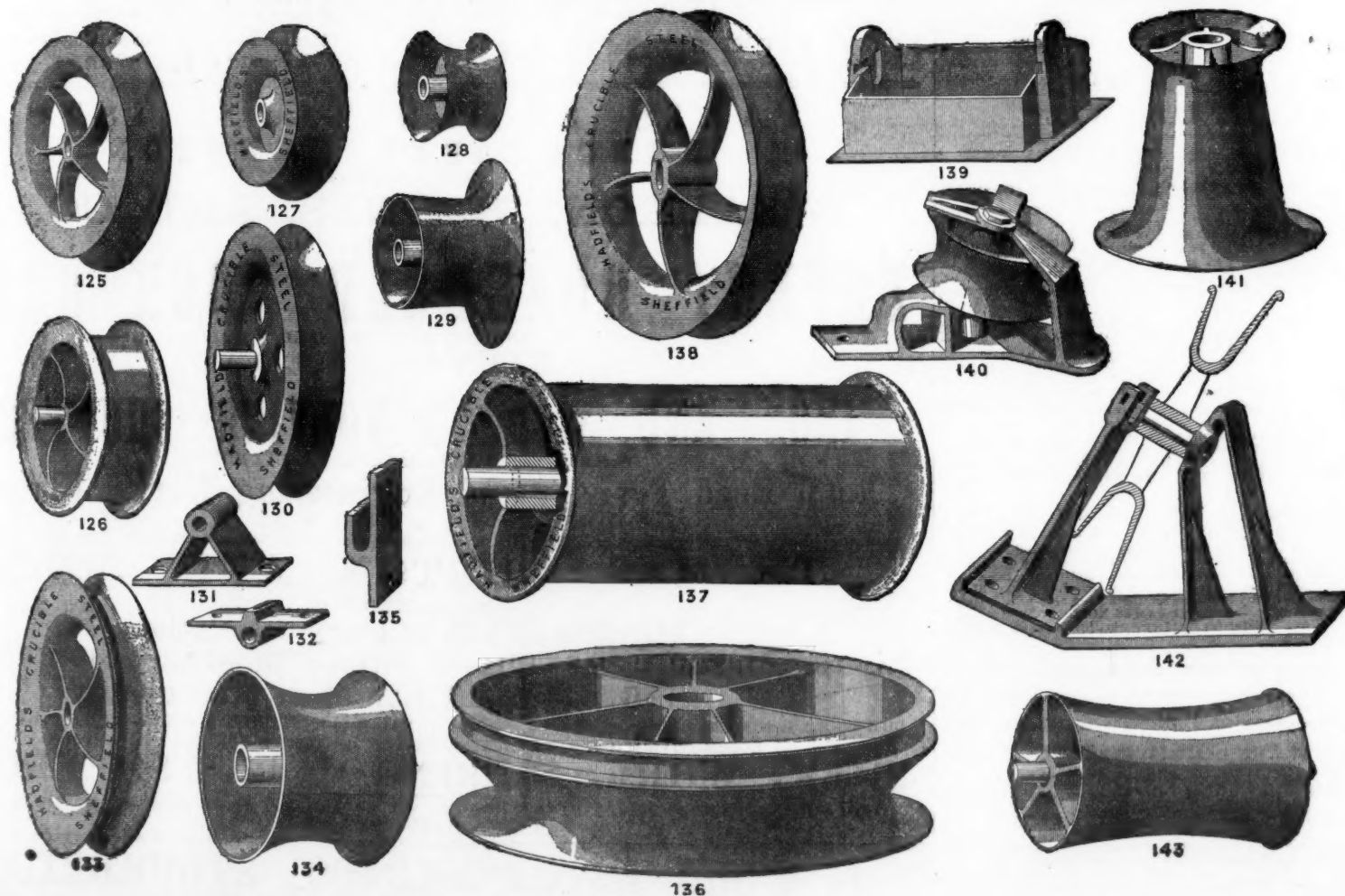
### ATTERCLIFFE, SHEFFIELD,

DEVOTE THEIR EXCLUSIVE ATTENTION TO THE MANUFACTURE OF

CRUCIBLE STEEL CASTINGS, for Engineering and Mining Purposes,

AND ARE THE SOLE MAKERS OF

## Hadfield's Steel Rollers and Pulleys.



This Advertisement is varied from time to time.

The following are some of the advantages claimed by the above Rollers and Pulleys:—

- 1.—LIGHTNESS.—They are cast by us from one-third to one-half lighter than cast-iron.
- 2.—SAVING OF HAULAGE POWER AND WIRE ROPES.—Our Pulleys and Rollers, being extremely light, they effect a great saving in haulage power, and considerably prolong the life of wire ropes. As our Rollers and Pulleys are equally balanced, and never lob-sided, the instant the rope or chain touches they readily revolve, and all grinding or sawing by the rope is avoided.
- 3.—STRENGTH.—Although extremely light they cannot be broken by ordinary means—say by the sudden passing of chains over them such as frequently connect the rope to the wagon, or hang loose from the end of the passing wagons.
- 4.—DURABILITY.—One of our Crucible Steel Rollers or Pulleys will outlast about TWELVE IRON ONES.
- 5.—They reduce wear and tear to a minimum, and are a great saving in working expenses.

FOR LIST OF PATTERNS, SIZES, AND WEIGHTS SEE LISTS No. 7 FOR ROLLERS AND No. 7A FOR PULLEYS.

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At the PARIS EXHIBITION the Jurors have Awarded

**THE GOLD MEDAL, THE SILVER MEDAL, AND HONOURABLE MENTION**  
FOR MY LATEST PATENTED STONE BREAKERS AND ORE CRUSHERS.

Stones broken equal, and Ores better, than by hand, at one-tenth the cost.

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ORIGINAL PATENTEE AND SOLE MAKER OF BLAKE'S

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New Patent Reversible Jaws,  
in Sections, with Patent  
Faced Backs.

NEW PATENT ADJUSTABLE  
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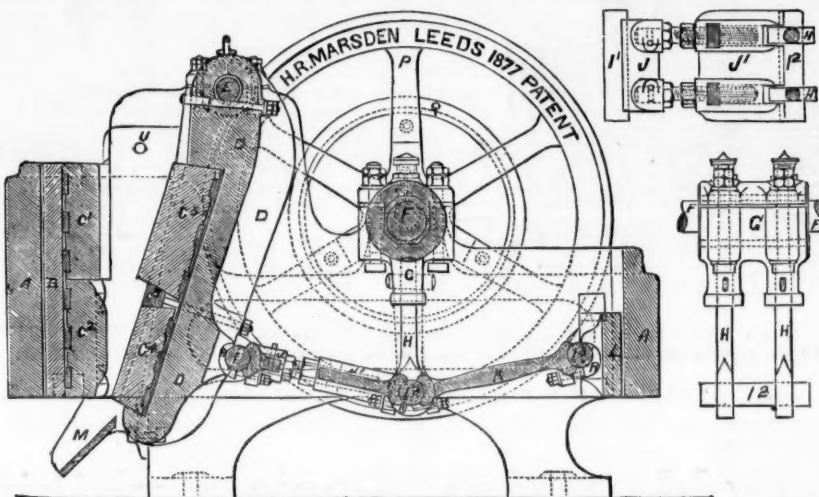
OVER 2500 IN USE.

New Patent Draw-back  
Motion.

NEW PATENT STEEL TOGGLE BEARINGS.

70

PRIZE MEDALS.



READ THIS—

Wharfedale Lime Works, Maryport, Whitehaven,  
November 7, 1878.  
H. E. MARSDEN, Esq., Soho Foundry, Leeds.  
DEAR SIR,—The machine I have in use is one of the large  
size, 24 in. by 12 in. The quantity we are breaking daily with  
this one machine is 250 tons, the jaw being set to break to a  
size of 2½ in. We have, however, frequently broken over  
300 tons per day of ten hours, and on several occasions over  
350 tons during the same period. The stone we break is the  
blue mountain limestone, and is used as a flux in the various  
ironworks in this district. We have now had this machine in  
daily use for over two years without repairs of any kind, and  
have never had occasion to complain of any inconvenience in  
using the machine. I hope the one you are now making for  
me may do its work equally well. The cost—INCLUDING  
ENGINE-POWER, COALS, ENGINEMAN, FEEDING, and all EXPENSES  
OF EVERY KIND—is just 3d. per ton. Should any of your  
friends feel desirous of seeing one of your machines at work  
I shall have much pleasure in showing the one alluded to.  
I am, dear Sir, yours very truly,  
WILLIAM MILLER.

AND THIS—

Wharfedale Lime Works, Aspathia, Cumberland,  
July 11th, 1878.  
H. R. MARSDEN, Esq., Soho Foundry, Leeds.  
DEAR SIR,—We are in receipt of your letter of 4th inst.  
may just state that the stone breaker above named has been  
under my personal superintendence since its erection, and  
have no hesitation in saying that it is as good now as it was  
five years ago.  
I am, dear Sir, yours faithfully,  
FRANCIS GOULD.

GREATLY REDUCED PRICES ON APPLICATION.

ALL BEARINGS are renewable, and made of H.R.M.'s Patent Compound ANTIFRICTION METAL.

CATALOGUES, TESTIMONIALS, &c.

H. R. MARSDEN, SOHO FOUNDRY, LEEDS, ENGLAND.

## The Barrow Rock Drill COMPANY

Are NOW PREPARED to SUPPLY their DRILLS, the ONLY  
ONES that have been SUCCESSFULLY WORKED in the  
MINES of CORNWALL. At DOLCOATH MINE, in the  
HARDEST known ROCK, a SINGLE MACHINE has, since  
its introduction in July, 1876, driven MORE THAN THREE  
TIMES the SPEED of HAND LABOUR, and at TWENTY PER  
CENT. LESS COST PER FATHOM.

In ordinary ends two machines may be worked together,  
and at a proportionately increased speed. They are strong,  
light, and simple, easily worked, and adapted for ends and  
stopes, and the sinking of winzes and shafts.

The company are also prepared to SUPPLY COMPRESSORS,  
and all necessary appliances for working the said Drills.

Apply to—

**LOAM AND SON,  
LISKEARD, CORNWALL.**

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FOR CONVEYING  
CHARGE IN



SAFETY FUSE  
FIRE TO THE  
BLASTING ROCKS &c.

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the "INTERNATIONAL EXHIBITION" of 1862 and 1874, in London; at the  
"IMPERIAL EXPOSITION," held in Paris, in 1855; at the "INTERNA-  
TIONAL EXHIBITION," in Dublin, 1865; at the "UNIVERSAL EXPOSI-  
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FORD, SMITH, AND CO. CLAIM SUCH TWO SEPARATE THREADS as  
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## Air-Compressing Machinery,

Simple, strong, and giving most excellent results, and  
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Full particulars of rapid and economical work effected  
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CONTRACTS TAKEN, OR SPECIAL TERMS FOR HIRE.

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AND THE HIGHEST AWARD,

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**Canal Head Foundry and Engineering Works, Ulverston,**  
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